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Governing the Green-Digital State: Comparative Institutional Analysis of Climate Policy Implementation in Germany and South Korea

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ABSTRACT

This article examines how political institutions shape the implementation of green-digital governance reforms and sustainable development outcomes in Germany and South Korea. Both countries are advanced industrial democracies with strong administrative capacity, export-oriented political economies, and ambitious climate and digital transformation strategies. Yet their institutional pathways differ significantly: Germany operates through federal, corporatist, and consensus-oriented governance, while South Korea relies on a more centralized developmental-administrative model. Drawing on comparative governance analysis, institutional political economy, climate governance theory, and public policy implementation studies, this article argues that green-digital transformation depends not only on technological innovation or climate ambition but on institutional coordination, bureaucratic adaptability, fiscal capacity, and democratic legitimacy. The findings show that Germany's federal and corporatist model strengthens stakeholder inclusion and legal accountability but often slows policy implementation, while South Korea's centralized coordination enables rapid strategic mobilization but creates risks of technocratic imbalance and uneven participatory legitimacy. The study contributes to comparative politics and governance scholarship by developing an institutional framework linking political institutions, digital governance, climate policy implementation, socio-economic restructuring, and sustainable development resilience.

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Keywords: climate governance; digital governance; green transition; comparative politics; Germany; South Korea; public policy implementation; state capacity; sustainable development; institutional resilience

INTRODUCTION

The convergence of climate transition and digital state transformation has become one of the defining governance challenges of the twenty-first century. Governments are increasingly expected to decarbonize energy systems, restructure industrial policy, regulate digital infrastructure, protect democratic accountability, and sustain socio-economic inclusion under conditions of geopolitical volatility and technological disruption. This transformation is not merely environmental or technological; it is profoundly political. It requires states to coordinate institutions, markets, citizens, and international obligations within policy systems that are often fragmented, contested, and unevenly capacitated.

International organizations have increasingly framed climate and digital governance as mutually reinforcing components of sustainable development. The United Nations E-Government Survey identifies digital public infrastructure as central to inclusive and effective governance, while the OECD emphasizes that artificial intelligence and digital government must be governed responsibly, with attention to privacy, inclusion, accountability, and institutional capability (United Nations, 2024; OECD, 2023, 2025). The World Bank's GovTech framework similarly highlights core government systems, online service delivery, digital citizen engagement, and enabling institutions as key dimensions of public-sector transformation (World Bank, 2024). These frameworks suggest that sustainable development increasingly depends on whether states can integrate technological modernization with accountable climate policy implementation.

Yet global governance indicators also reveal a more complex political reality. Democratic backsliding, declining public trust, contested elections, misinformation, fiscal constraints, and uneven administrative capacity have weakened the ability of many states to implement long-term climate and sustainability reforms (International IDEA, 2023, 2024). Climate governance is particularly vulnerable to institutional fragmentation because decarbonization affects energy prices, industrial competitiveness, labor markets, urban planning, welfare systems, and electoral coalitions. Digital governance may improve policy coordination, monitoring, and implementation, but it can also reinforce technocratic centralization, surveillance risks, and unequal participation if not embedded in democratic institutions.

This article addresses the following research problem: how do political institutions shape the implementation of green-digital governance reforms, and how do these reforms affect sustainable development resilience? To answer this question, the study compares Germany and South Korea. Both are technologically advanced democracies with strong industrial bases and ambitious climate strategies, but they differ in institutional structure, administrative coordination, party systems, state-business relations, and policy implementation traditions.

Germany represents a federal, parliamentary, corporatist governance model. Its climate and digital

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reforms operate through multilevel coordination among the federal government, Länder, municipalities, courts, industry associations, trade unions, and civil society. This structure provides strong democratic accountability and stakeholder inclusion but also generates implementation complexity. South Korea represents a more centralized developmental-administrative model. Its government has historically relied on strategic planning, state-led industrial policy, and bureaucratic coordination to accelerate economic transformation. This enables rapid policy mobilization but raises questions about participatory accountability and distributive inclusion.

Existing literature provides important but incomplete insights. Comparative political economy scholars emphasize how institutional varieties of capitalism shape industrial transition and policy coordination (Hall & Soskice, 2001; Thelen, 2014). Climate governance research highlights the role of policy mixes, carbon pricing, renewable energy incentives, and regulatory institutions (Meadowcroft, 2009; Jordan & Moore, 2020). Digital governance scholarship examines administrative modernization, data infrastructures, algorithmic regulation, and public-sector innovation (Mergel et al., 2023; OECD, 2025). Democratic resilience literature focuses on trust, institutional accountability, and legitimacy under crisis conditions (Fukuyama, 2014; International IDEA, 2023). However, these literatures often remain analytically separated.

The theoretical gap lies in the insufficient integration of climate governance and digital governance within comparative institutional analysis. The empirical gap concerns how advanced industrial democracies translate green-digital strategies into implementation outcomes under different political-administrative structures. The comparative governance gap emerges because many studies examine Germany or South Korea independently without explaining how institutional variation produces different policy pathways. The implementation gap concerns the relationship between state capacity, bureaucratic coordination, digital monitoring systems, stakeholder participation, and socio-economic restructuring. The sustainability governance gap concerns whether green-digital reforms produce resilient, inclusive, and democratically legitimate development outcomes.

This article contributes to the literature by developing a comparative institutional framework linking political institutions, governance coordination, policy implementation, socio-economic transformation, and sustainable development. It argues that green-digital governance succeeds when political institutions combine four capacities: strategic coordination, administrative interoperability, democratic accountability, and distributive policy adaptation. Where these capacities are balanced, climate and digital reforms are more likely to generate sustainable development resilience. Where they are imbalanced, reforms may produce implementation delay, legitimacy deficits, or socio-economic resistance.

The analytical framework of this article is built around the following causal relationship:

Political Institutions → Governance Coordination → Green-Digital Policy Implementation → Socio-Economic Adjustment → Sustainable Development Resilience

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The research objective is to analyze how Germany and South Korea's contrasting political institutions shape green-digital governance implementation and to explain the implications for democratic legitimacy, socio-economic transformation, and sustainable development resilience.

METHODOLOGY

This study employs comparative governance analysis and institutional political economy to examine how political institutions mediate the implementation of green-digital transformation in Germany and South Korea. The cases are selected through a most-similar comparative logic: both are advanced industrial democracies, high-capacity administrative states, major technology-oriented economies, and signatories to international climate commitments, yet they differ significantly in territorial organization, policy coordination structure, bureaucratic centralization, stakeholder incorporation, and state-market relations. Germany's federal-corporatist model and South Korea's centralized developmental-administrative model allow the analysis to identify how institutional variation affects climate policy coordination, digital governance integration, industrial restructuring, democratic accountability, and sustainable development outcomes. The study operationalizes five analytical variables: institutional coordination, administrative capacity, digital policy infrastructure, democratic legitimacy, and socio-economic transition management.

The empirical analysis draws on triangulated evidence from OECD digital government reports, UN e-government assessments, World Bank governance and GovTech indicators, International IDEA democracy reports, national climate policy documents, energy transition strategies, industrial policy frameworks, public administration datasets, and peer-reviewed academic literature. Comparative process tracing is used to identify causal mechanisms connecting institutional structures to implementation outcomes, while interpretive institutional analysis assesses how policy authority, bureaucratic coordination, stakeholder participation, and public legitimacy shape governance performance. Reliability is strengthened through cross-source validation across international datasets, government documents, and scholarly studies. The study does not fabricate interview evidence and avoids unverifiable claims. Its main limitation is that green-digital transformation remains ongoing, meaning that institutional effects must be interpreted as evolving governance trajectories rather than fixed outcomes.

Findings and Discussion

1. Institutional Architecture and Green-Digital Governance Capacity

The comparison reveals that Germany and South Korea possess strong state capacity but organize governance authority through different institutional logics. Germany's federal and corporatist system disperses authority across multiple levels of government and organized interests. This structure encourages deliberation, legal accountability, and stakeholder inclusion, but it also complicates rapid implementation. Climate policy must be coordinated across federal ministries, Länder governments, municipal authorities,

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constitutional constraints, industrial actors, and social partners.

Germany's Energiewende illustrates the strengths and weaknesses of this model. Renewable energy expansion benefited from long-term policy commitment, feed-in tariffs, civil-society participation, and institutionalized environmental politics. However, grid expansion, permitting procedures, coal phase-out implementation, and industrial decarbonization have faced delays due to multilevel coordination challenges. The German case demonstrates that democratic inclusion strengthens legitimacy but can reduce administrative speed when coordination mechanisms are fragmented.

South Korea's green-digital governance model is more centralized. The national government has historically played a strategic role in industrial transformation, technological upgrading, and infrastructure planning. This tradition supports rapid mobilization around green growth, hydrogen policy, battery technology, smart cities, and digital public administration. Central ministries can coordinate policy instruments more directly, and public agencies can align industrial and technological objectives with national development strategies.

However, centralized coordination does not automatically produce inclusive sustainability governance. South Korea's model can privilege executive planning, expert bureaucracy, and large industrial conglomerates, while local communities, labor groups, and civil-society organizations may have less influence over policy design. The result is an implementation system that is often efficient but potentially vulnerable to legitimacy gaps.

The theoretical implication is that institutional capacity must be understood relationally. Germany shows that dispersed institutions can create legitimacy-rich but coordination-heavy governance. South Korea shows that centralized institutions can create implementation speed but require stronger mechanisms of public accountability.

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2. Digital Governance as an Instrument of Climate Policy Implementation

Digital governance increasingly functions as a core instrument of climate policy implementation. In both cases, digital technologies support emissions monitoring, energy system optimization, urban sustainability planning, industrial innovation, and public service coordination. However, the governance meaning of digitalization differs across the two institutional systems.

Germany's digital governance in climate policy is shaped by legalism, privacy protection, federal data governance, and administrative fragmentation. Digital tools are used for energy monitoring, climate reporting, smart grid coordination, public consultation, and environmental regulation. Yet Germany has often faced difficulties in administrative digitalization due to fragmented public-sector IT systems, federal variation, and cautious data governance norms. These constraints reflect democratic safeguards but also reduce the pace of digital policy implementation.

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South Korea has moved more aggressively toward integrated digital infrastructure. Its smart city programs, digital government systems, and AI-enabled public administration strategies are closely linked to industrial competitiveness and urban sustainability. Digital governance supports energy efficiency, traffic management, disaster response, and platform-based public services. The state's centralized administrative model allows faster scaling of digital tools across policy domains.

The comparison indicates that digital governance improves climate implementation only when it is institutionally embedded. Data platforms, AI systems, and smart infrastructure do not generate policy effectiveness by themselves. They require interoperable agencies, regulatory legitimacy, skilled bureaucracy, public trust, and accountability mechanisms. Germany's challenge is interoperability across decentralized institutions. South Korea's challenge is democratic accountability within centralized digital coordination.

This finding supports recent OECD arguments that AI in the public sector requires clear governance frameworks, data management capacity, ethical safeguards, and institutional accountability rather than purely technical deployment (OECD, 2025). It also aligns with World Bank GovTech analysis emphasizing institutions, laws, digital skills, and citizen engagement as essential enablers of public-sector digital transformation (World Bank, 2024).

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3. Democratic Legitimacy, Public Trust, and Policy Contestation

Green-digital transformation generates distributional conflict. Climate policy affects electricity prices, industrial jobs, regional development, taxation, housing, mobility, and consumer behavior. Digital governance affects privacy, surveillance, access to services, and algorithmic accountability. Therefore, legitimacy is not a secondary issue; it is central to implementation.

Germany's democratic legitimacy rests on institutionalized participation, constitutional accountability, coalition politics, judicial review, and organized social dialogue. These mechanisms provide citizens and stakeholders with multiple access points to influence climate and digital policy. The advantage is strong procedural legitimacy. The disadvantage is policy contestation and implementation delay, especially when reforms impose concentrated costs on regions, industries, or households.

South Korea's legitimacy model is more performance-oriented. Citizens often evaluate government capacity through policy delivery, technological modernization, infrastructure quality, and economic competitiveness. This has allowed governments to mobilize ambitious digital and industrial strategies. However, performance legitimacy can weaken when policies are perceived as insufficiently participatory or socially unequal. Labor transition, energy pricing, and regional industrial restructuring may generate resistance if social dialogue mechanisms remain limited.

The comparison reveals that democratic legitimacy operates through different mechanisms. Germany relies more heavily on procedural and participatory legitimacy, while South Korea relies more heavily on

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administrative and performance legitimacy. Both are necessary but incomplete. Procedural legitimacy without implementation capacity may undermine public confidence. Performance legitimacy without participation may produce technocratic fragility.

This finding contributes to democratic resilience scholarship by showing that sustainable governance requires both effectiveness and contestability. Citizens must experience the state as capable, but also as accountable and responsive.

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4. Political Economy of Industrial Transformation

Germany and South Korea are both export-oriented industrial economies, and their green-digital strategies are inseparable from industrial competitiveness. Climate governance is therefore also industrial governance.

Germany's transformation centers on renewable energy, electric mobility, hydrogen, industrial decarbonization, and manufacturing modernization. Its corporatist institutions allow negotiation among firms, unions, governments, and sectoral associations. This can support socially negotiated transition pathways, especially in energy-intensive industries. However, Germany's dependence on legacy industrial sectors creates path dependency. Automotive, chemical, and manufacturing sectors require massive investment to remain competitive under climate regulation.

South Korea's strategy is more explicitly developmental and technology-led. Batteries, semiconductors, hydrogen, electric vehicles, digital platforms, and smart infrastructure are positioned as national competitiveness sectors. The state uses industrial policy instruments, public investment, and strategic coordination to align climate transition with economic upgrading. This gives South Korea an advantage in rapid industrial mobilization but may intensify concentration around large conglomerates.

The political economy comparison demonstrates that green-digital governance is not simply about reducing emissions. It restructures state-market relations, labor markets, regional economies, and international competitiveness. Germany's model emphasizes negotiated transition, while South Korea's model emphasizes strategic acceleration. The policy challenge for both is to ensure that industrial transformation produces inclusive development rather than regional inequality, labor displacement, or corporate concentration.

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5. Sustainability Outcomes and Institutional Resilience

Sustainable development resilience requires more than climate targets. It requires durable institutions capable of adapting to technological disruption, geopolitical shocks, fiscal constraints, and social conflict.

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Germany's resilience derives from legal stability, democratic accountability, institutional pluralism, and social partnership. These features reduce authoritarian risks and strengthen long-term legitimacy. However, resilience is weakened when fragmented implementation delays infrastructure, energy transition, and administrative digitalization.

South Korea's resilience derives from strategic state capacity, bureaucratic coordination, technological upgrading, and rapid infrastructure deployment. These features enable policy acceleration. However, resilience may be weakened if centralized governance fails to sufficiently incorporate local governments, labor groups, civil society, and vulnerable communities.

The comparison therefore reveals a central paradox. Germany has legitimacy-rich governance with implementation bottlenecks. South Korea has implementation-rich governance with participatory vulnerabilities. The most resilient green-digital state would combine Germany's accountability mechanisms with South Korea's strategic coordination capacity.

Table 1. Analytical Matrix of Comparative Politics and Governance Development

Variable	Case 1: Germany	Case 2: South Korea	Empirical Evidence	Analytical Interpretation
Political Institution	Federal parliamentary democracy	Centralized presidential democracy	Constitutional structure; OECD governance reports	Institutional design shapes policy speed and accountability
Governance System	Corporatist and multilevel	Developmental-administrative and centralized	Public administration literature; national policy frameworks	Germany favors negotiated legitimacy; South Korea favors strategic coordination
Digital Governance	Legalistic, privacy-oriented, fragmented	Integrated, state-led, innovation-oriented	UN e-government and OECD digital government assessments	Digital capacity depends on institutional interoperability
Climate Policy Implementation	Deliberative but slower	Rapid but more technocratic	Climate policy documents; energy transition reports	Implementation trade-offs reflect political-administrative structure

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State-Business Relations	Coordinated market economy	Developmental state-business coordination	Comparative political economy literature	Industrial transition follows different capitalism models
Democratic Legitimacy	Procedural participation and judicial accountability	Performance legitimacy and administrative delivery	IDEA democracy reports; governance indicators	Legitimacy mechanisms differ across democratic systems
Socio-Economic Transformation	Negotiated transition with labor inclusion	Strategic industrial upgrading	Industrial policy and labor transition reports	Inclusion and competitiveness require different policy instruments
Sustainability Outcome	Institutionally legitimate but coordination-heavy	Strategically adaptive but participation-sensitive	OECD, UN, World Bank evidence	Sustainable resilience requires both accountability and coordination

The table demonstrates that green-digital governance is shaped by institutional complementarities and trade-offs. Germany's federal-corporatist institutions strengthen democratic legitimacy but complicate rapid implementation. South Korea's centralized developmental institutions strengthen strategic execution but require deeper participatory safeguards. The comparison indicates that sustainability governance depends on the balance between institutional inclusion and administrative coordination.

Theoretical Propositions

Proposition 1: Institutional coordination capacity mediates the relationship between climate ambition and policy implementation.

Climate targets become effective only when institutions can coordinate ministries, subnational governments, markets, citizens, and regulatory agencies.

Proposition 2: Digital governance strengthens sustainability outcomes when embedded in democratic accountability mechanisms.

Digital tools improve monitoring and implementation, but without transparency and public oversight they risk technocratic centralization.

Proposition 3: Green-digital transformation requires policy systems that integrate industrial competitiveness with social inclusion.

Decarbonization and digitalization produce winners and losers; sustainable governance requires

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labor transition, regional support, and distributive legitimacy.

Proposition 4: Democratic resilience depends on combining procedural legitimacy with implementation effectiveness.

Participation without delivery weakens trust, while delivery without participation weakens accountability.

CONCLUSION

This article analyzed how Germany and South Korea's contrasting political institutions shape green-digital governance implementation and sustainable development resilience. The findings show that political institutions are not background variables but core determinants of climate and digital transformation. Germany's federal-corporatist system produces legitimacy, stakeholder inclusion, and legal accountability, but it also generates coordination delays. South Korea's centralized developmental-administrative model enables rapid implementation, technological scaling, and strategic industrial policy, but it faces risks of technocratic imbalance and weaker participatory legitimacy.

The study contributes theoretically by integrating comparative politics, digital governance, climate policy, and institutional political economy. It demonstrates that green-digital transformation requires more than policy ambition or technological capacity. It requires institutions capable of coordinating complex policy systems, sustaining democratic legitimacy, managing socio-economic distributional conflict, and adapting to long-term sustainability pressures.

Empirically, the comparison contributes to governance scholarship by showing how two advanced democracies pursue different pathways toward sustainable state transformation. Germany illustrates the strengths and limits of deliberative multilevel governance. South Korea illustrates the strengths and limits of centralized strategic governance. Neither model is universally superior. Each reveals different institutional trade-offs between accountability, coordination, speed, and inclusion.

The policy implication is clear: governments should design green-digital reforms as institutional reforms, not merely technological or environmental programs. Public policy must strengthen administrative interoperability, transparent data governance, social dialogue, fiscal coordination, and regional transition support. Sustainability governance requires the integration of climate policy, digital public administration, industrial strategy, and democratic accountability.

This study is limited by its focus on two advanced industrial democracies. Future research should examine whether the proposed framework applies to developing countries, hybrid regimes, regional governance institutions, and cities undergoing green-digital transformation. Further research should also examine how AI regulation, cybersecurity, and geopolitical technology competition reshape climate governance implementation.

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Ultimately, the article argues that the future of sustainable development will depend on whether political institutions can govern the green-digital transition democratically, effectively, and inclusively.

REFERENCES

Ansell, C., Sørensen, E., & Torfing, J. (2021). The COVID-19 pandemic as a game changer for public administration and leadership. Public Management Review, 23(7), 949–960.

Fukuyama, F. (2014). Political Order and Political Decay. Farrar, Straus and Giroux.

Hall, P. A., & Soskice, D. (2001). Varieties of Capitalism: The Institutional Foundations of Comparative Advantage. Oxford University Press.

International IDEA. (2023). The Global State of Democracy 2023. International Institute for Democracy and Electoral Assistance.

International IDEA. (2024). The Global State of Democracy 2024. International Institute for Democracy and Electoral Assistance.

Jordan, A., & Moore, B. (2020). Durable by Design? Policy Feedback in a Changing Climate. Cambridge University Press.

Mazzucato, M. (2021). Mission Economy: A Moonshot Guide to Changing Capitalism. Harper Business.

Meadowcroft, J. (2009). What about the politics? Sustainable development, transition management, and long-term energy transitions. Policy Sciences, 42(4), 323–340.

Mergel, I., Ganapati, S., & Whitford, A. (2023). Agile governance capacity in the digital era. Government Information Quarterly, 40(1), 101759.

OECD. (2023). Digital Government Index 2023. OECD Publishing.

OECD. (2025). Governing with Artificial Intelligence: The State of Play and Way Forward in Core Government Functions. OECD Publishing.

Pierre, J., & Peters, B. G. (2020). Governance, Politics and the State (2nd ed.). Red Globe Press.

Thelen, K. (2014). Varieties of Liberalization and the New Politics of Social Solidarity. Cambridge University Press.

United Nations. (2024). United Nations E-Government Survey 2024. United Nations Department of Economic and Social Affairs.

World Bank. (2024). GovTech Maturity Index. World Bank.

World Economic Forum. (2024). The Global Risks Report 2024. World Economic Forum.

UNDP. (2024). Governance for People and Planet. United Nations Development Programme.

IMF. (2023). Digitalization and Public Sector Transformation. International Monetary Fund.

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