

A Grounded Theory of Local Climate Plan-Making: Focusing on Planners' Bounded Rationality

Extended Summary

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Abstract

Many national governments now require local governments to prepare climate plans under a common guideline. However, little is known about how these plans are actually made, that is, how planning actors respond to the requirements of the guideline under constrained conditions and how their responses are recorded in the plan documents. Previous studies have concentrated on evaluating the quality and implementation of completed plans, and a theory of plan-making behavior is still missing. This study analyzed the first master plans for carbon neutrality and green growth prepared by Korean municipal governments under a single national guideline, and theorized the plan-making process from the perspective of planners' bounded rationality. The sample consists of 20 municipalities located at both extremes of carbon intensity. Procedural grounded theory following Strauss and Corbin was applied to the full text of the plans, which amounts to 5,491 pages. For open coding, draft codes generated by a large language model were combined with a full review of every code by the researcher. From 975 coded incidents, 79 concepts, 16 subcategories, and 6 main categories were derived, and the analysis was concluded when new concepts no longer emerged. The results show that planning actors, while acknowledging their limited authority, data, and capacity, responded by delegating judgment to higher levels of government and to the planning consulting market, by reducing the task to a manageable size along the boundary of their administrative jurisdiction, and by constructing the plausibility of the document with justifications and figures. In only 16 of the 975 incidents did planning actors challenge the national standard on the basis of a substantive local diagnosis. The study conceptualizes this set of behaviors as standardized localization, which means meeting the national standard while filling one's own region into it. As a result, the plans came to resemble each other in form, while the scope of emissions covered and the substance of local diagnosis diverged across regions, and this divergence remains hidden beneath the similarity of form. These findings suggest that formal review alone can hardly distinguish between plans, that delegation should be managed rather than eliminated, and that a channel through which local experience feeds back into the revision of the guideline deserves consideration.

Keywords: local governments; master plan for carbon neutrality and green growth; planners' bounded rationality; procedural grounded theory; large language models

1. Background and Purpose

The preparation of a climate plan has become a standard policy instrument for local climate governance, but plans do not always lead to action and emission reductions (Rogers et al., 2025; Pathak et al., 2026). In 2021, Korea enacted the Framework Act on Carbon Neutrality and Green Growth, which obligates every local government to prepare a master plan for carbon neutrality and green growth. The national government provided a standard guideline that prescribes the table of contents of the plan and the method of greenhouse gas accounting. Municipalities with very different industrial structures, budgets, and staff therefore produced plans of the same format under the same instructions. This institutional condition offers a rare opportunity to observe local plan-making in a comparable form.

Existing studies on local climate plans under a guideline have concentrated on evaluating the quality and implementation of the completed documents. They report that mandates do not guarantee plan

quality and that plans written under a common framework tend to become uniform or to replicate higher-level plans (Lyles et al., 2014; Jogesh & Dubash, 2015; Óvári et al., 2023). What remains unexplained is the process behind these outcomes, namely how planning actors working under constraints respond to the guideline and how their responses shape the content of the plans. The purpose of this study is to theorize this process with grounded theory, asking how municipal planning actors respond to the constraints of the national guideline and how the differences in their responses produce the differences between plans. Bounded rationality is used not as a hypothesis to be tested but as a sensitizing concept that helps interpret the categories emerging from the data.

2. Theoretical Background

Plan-making in practice. A plan fixes future actions through present decisions, and the decisions are recorded in a plan document. Because a plan deals with the future, the correctness of its decisions cannot be proven in advance, and the existence of a plan does not guarantee implementation. Empirical studies of planning practice show that actual plan-making deviates from the normative sequence of diagnosis, goal setting, comparison of alternatives, and implementation design. Alternatives are examined narrowly around preferred solutions and precedents (Marsden et al., 2012), and surveys and analyses often go no further than filling in the items required by regulations. In addition, the writing of plans is largely outsourced. Local planning staff are small in number and concentrate on legal compliance and contract management, while private planning offices and consultants produce much of the text (Aksümer, 2023; Christensen & Collington, 2026). The content and quality of a plan therefore depend on the production structure, that is, on who writes and who reviews.

Guidelines and planners' bounded rationality. Higher levels of government demand local plans to secure the implementation of national targets, and the demand usually arrives in the form of a guideline that prescribes the contents and methods of the plan. For the demanding side, the guideline is an instrument of control; for the receiving side, it is a channel of resources and legitimacy (Andrews et al., 2013; Philp & Cohen, 2020). Bounded rationality starts from the observation that actors cannot compare all alternatives because of limits of information, time, and cognition, and that they stop searching when a workable alternative is found (Simon, 1955). Simon (1976) further distinguished substantive rationality, judged by outcomes, from procedural rationality, judged by whether an appropriate procedure was followed under given conditions. Planners work under exactly such conditions. Seen in this way, a guideline is a device designed to compensate for planners' bounded rationality. It reduces the cost of search by fixing the items to examine, makes the problem manageable by setting the boundary of accounting, and supplies procedural rationality from outside. However, compensation is also substitution. The more the guideline decides, the less the planner judges. The divided evaluations of guidelines in the literature, capacity building on one side (Philp & Cohen, 2020) and uniformity on the other (Lyles et al., 2014; Óvári et al., 2023), correspond to these two faces. The question of which face prevails can be answered only by observing the act of judgment itself, and this is what the present study undertakes.

3. Data and Methods

The data are the first master plans for carbon neutrality and green growth prepared by 20 municipal governments in 2024 and 2025 under Article 12 of the Framework Act, each running 114 to 530 pages. The plan document is the only official record that all municipalities produced for the same task, at the same time, and under the same instructions, and the judgments and justifications of the planning actors are fixed in the text in the form they had at the time of preparation. The national guideline of September 2024 was used as contextual material, not as an object of coding. Structures and statements common to all documents were treated as institutional conditions created by the guideline, and the judgments and

choices that vary across municipalities were the object of coding.

The sample consists of the 10 municipalities with the lowest carbon intensity, defined as greenhouse gas emissions per unit of gross regional domestic product, and the 10 with the highest. This purposive sampling maximizes the variation of concepts at the point where the emission structures that the plans must address differ most. Theoretical sampling was implemented through the order of analysis, starting from a pilot document and moving across the low-intensity and high-intensity groups, and four low-intensity documents were kept for the last batch to test theoretical saturation.

Procedural grounded theory following Strauss and Corbin (1998) was applied through open, axial, and selective coding. Because the corpus of about 5,400 pages exceeds what a single researcher can code consistently, a large language model was used to generate draft codes for open coding. The model received a standardized, version-controlled instruction at temperature zero and no information about the researcher's concepts. Every draft code was verified individually by the researcher, including a verbatim check of the quoted text, and all scholarly judgments, including the confirmation of codes, the merging of concepts, the construction of categories, and the derivation of the theory, were made by the researcher. This division of labor is consistent with the converging conclusion of recent methodological studies that large language models perform comparably to human coders at the level of open coding but remain weak at abstract integration (Zhou et al., 2024; Chang et al., 2026; He & Wang, 2026).

4. Results

Open coding. From the 20 documents, 975 incidents in which the planning actor's judgment, choice, strategy, or justification appears were coded and consolidated into 79 concepts and 16 subcategories. The subcategories span four relational domains: the actor's posture toward the higher system, toward its own region, toward the planning task, and toward itself. Postures toward the higher system account for more than a quarter of all incidents, dominated by the acceptance of higher standards and the reliance on external capacity. The verbatim transcription of higher-level content, appearing 39 times in 9 documents, is the documentary extreme of this reliance. In contrast, negotiation with or deviation from the higher standard appears in only 16 of the 975 incidents. The numbers of new concepts across the five analysis batches were 21, 25, 18, 10, and 5, and the final batch of four documents produced no new concepts, so the system was judged to have reached theoretical saturation.

Axial coding. The 16 subcategories converged into six main categories according to the problem to which each responds, as shown in Table 1.

Main category	n	Description
B1 Delegation of judgment	190	Placing the source of judgment outside, from accepting higher standards to entrusting calculation, data, and content to higher governments and consultants
B2 Reduction of the problem	164	Reducing the task to a manageable size by drawing boundaries along administrative jurisdiction, selecting feasible projects, and deferring decisions
B3 Construction of plausibility	204	Producing the legitimacy of the document with borrowed rationales, assertions of locality, assembled figures, and evaluation management
B4 Mobilization of the local	267	Bringing local information, demands, and assets into the plan; the substantiveness of mobilization is the key internal variation
B5 Self-management	134	Acknowledging the actor's own limits in the document and complementing them with organizational arrangements
B6 Challenge to the standard	16	Confronting the standard itself by compromising, bargaining, refusing, or demanding institutional change; rare, and its rarity is itself a finding

Table 1. Six main categories (n = number of coded incidents)

Selective coding. The core category that runs through the six main categories is standardized localization, the dual task of meeting the single national standard and format while filling one's own region into it, performed with limited authority and capacity. The storyline is as follows. Municipalities prepare their plans under the same legal obligation and guideline, drawing on the accounting support of provincial governments and the services of the planning consulting market. The obligation is comprehensive, but authority, data, and staff fall short of it, and the planning actors acknowledge this gap throughout the documents (B5). The basic responses to the gap are delegation (B1) and reduction (B2). Because a delegated and reduced plan still needs legitimacy as a document, the construction of plausibility (B3) follows, and the mobilization of the local (B4) supplies its material. The substantiveness of mobilization is the branching point. Formulaic mobilization is absorbed into plausibility, whereas a substantive diagnosis of the local emission structure becomes the premise of the rare challenge to the standard (B6). The collective consequence is formal convergence and substantive divergence. The plans resemble each other in structure, sentences, and the way figures are composed, while the scope of emissions actually covered, the substance of diagnosis, and the character of targets diverge across regions, and this divergence appears only when the documents are compared side by side.

5. Discussion

The finding that plans under a common framework resemble each other is consistent with previous reports (Lyles et al., 2014; Jogesh & Dubash, 2015; Óvári et al., 2023). What this study adds is an account of the behavior that produces the resemblance. The account differs from the diagnosis of isomorphic mimicry, in which organizations adopt the appearance of reform to gain legitimacy without the corresponding function (Andrews et al., 2013). The planning actors in this corpus repeatedly disclosed their limits of authority, data, and capacity in the documents, which is difficult to reconcile with a dominant strategy of disguise. In these data, the driver of resemblance was closer to satisficing than to camouflage. The outsourced production of plans reported in the literature (Aksümer, 2023; Christensen & Collington, 2026) also matches the dispersion of writing observed here, and the verbatim transcription of higher-level content provides document-level evidence of how resemblance travels between plans. The reduction of the problem parallels the displacement of conflicting goals reported in Norwegian planning (Oseland & Haarstad, 2022), although the motive differs: displacement there avoided political conflict, whereas reduction here fit an imposed task into limited authority and capacity. Finally, the results allow the two opposing evaluations of planning mandates, capacity building and uniformization, to be read as descriptions of two different layers, form and substance. These interpretations rest on what is recorded in the documents; political factors that leave no trace in the text are beyond the reach of these data.

6. Conclusion

Under a single national guideline, municipal planning actors responded to the gap between their obligations and their means by delegating judgment, reducing the problem, and constructing plausibility, and the accumulation of these responses, conceptualized as standardized localization, made the plans converge in form while their substance diverged. The same theory emerged from both extremes of carbon intensity, which supports the view that the observed behavior originates in the common conditions of a single standard, limited authority, and an outsourced production structure rather than in the emission structure of a region. Bounded rationality, in this account, is a condition under which planners work rather than a deficiency of individual planners.

Three implications follow within the scope of the findings. Where the form of plans is standardized,

review that checks form alone can hardly distinguish between plans. Delegation appeared across the whole sample, so managing it is more realistic than trying to remove it. Because objections to the fit of the standard were rare, a channel through which local plan-making experience feeds back into the revision of the guideline deserves consideration. The limitations are that the analysis is confined to plan documents and cannot observe internal negotiations or implementation, that the absence of a counterfactual without the guideline precludes any overall judgment on whether the guideline widened or narrowed regional gaps, and that the sample design confounds carbon intensity with urban character.

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