Politics and Governance
2026 • Volume 14 • Article 12501
https://doi.org/10.17645/pag.12501

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Open Access Journal

Profiles of Structural Exclusion in the Twin Transition: Ideal Types, Political Disaffection, and Participatory Governance

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Submitted: 31 March 2026 **Accepted:** 5 August 2026 **Published:** 17 September 2026

Issue: This article is part of the issue "Bridging Divides in the Twin Transition: Governance for Equity and Inclusion" edited by Olga Kolotouchkina (Complutense University of Madrid), Paloma Piqueiras (Complutense University of Madrid), and Sara Clavero (Technological University Dublin), fully open access at https://doi.org/10.17645/pag.i520

Abstract

This article analyses how the simultaneous pursuit of green decarbonisation and digital transformation—the twin transition—generates disproportionate structural burdens on marginalised social groups. Drawing on Max Weber's ideal-type methodology (*Idealtypus*) and Spanish statistical evidence, it develops six prototypical profiles of structural exclusion across key twin-transition sectors: urban mobility and transport, the platform and gig economy, rural energy and depopulation, digital public infrastructure and smart cities, digital agriculture, and urban renovation. Each profile identifies the mechanisms through which green and digital policies impose unequal costs on vulnerable groups, examining the resulting dynamics of institutional disaffection, potential political radicalisation, and common structural patterns. Comparative analysis identifies four recurring exclusion mechanisms—the upfront cost barrier, the digital literacy gateway, the geographic penalty, and knowledge disqualification—tracing a common pathway from structural exclusion to political disaffection. The article concludes by proposing five governance principles grounded in community work and participatory governance, offering a framework transferable to comparable EU contexts.

Keywords

community work; digital transition; energy poverty; green transition; mobility justice; participatory governance; precariate; radicalisation; social exclusion; twin transition

1. Introduction: The Twin Transition and the Risk of a Divided Society

The simultaneous pursuit of green decarbonisation and digital transformation, generally known as the twin transition, represents one of the most ambitious structural transformations of our era. Promoted by the EU through the European Green Deal and Digital Compass 2030, this dual transformation promises a cleaner and more prosperous future (European Commission, 2019, 2021a; Kovacic et al., 2024). However, the twin transition is not neutral: Its costs and benefits are distributed unevenly across social groups, geographic territories, and generational cohorts (Kovacic et al., 2024; Petmesidou & Guillén, 2022). While it opens opportunities for educated, digitally literate, and economically secure populations, it simultaneously imposes substantial burdens on low-income households, rural communities, precarious workers, older adults, and migrants (Rodríguez-Pose & Bartalucci, 2024). Without deliberate redistributive and participatory mechanisms, it may fuel social disaffection, institutional distrust, and, in the most acute cases, radicalisation and support for extremist movements (Bosetti et al., 2025; Rodríguez-Pose & Bartalucci, 2024; Yazar & Haarstad, 2023). We term this condition "transition precarity."

These dynamics have been approached from multiple disciplinary angles. Energy poverty research has documented the regressive distributional effects of green policies on low-income households (Bouzarovski & Petrova, 2015). Mobility justice scholarship has examined how transport decarbonisation can harm peripheral workers (Kuttler & Moraglio, 2020). Digital inclusion research has mapped structural barriers for older adults, rural, and low-income populations (van Dijk, 2019). Labour studies have documented platform economy precarity (Fairwork España, 2025; Mandl, 2021). Urban political ecology has examined eco-gentrification and its displacement effects on working-class communities (Anguelovski et al., 2018; Checker, 2011). Three significant gaps remain: the absence of an integrated cross-sectoral analytical framework; the unsystematic link between material exclusion and political disaffection in transition governance analysis; and the understudied potential of community work as a structural governance response. This article addresses all three through Weberian ideal-type methodology applied to six key twin-transition sectors.

The twin transition is not self-executing but deliberately steered by a coalition of institutional actors: the European Commission through the European Green Deal and Digital Compass 2030; national governments through National Energy and Climate Plans and Recovery and Resilience Plans; and large platform corporations, energy utilities, and real estate investors whose market power shapes distributional consequences. The absence of community organisations from this governance architecture is structural: These actors are potential co-architects whose inclusion is a democratic requirement, as the five governance principles developed in Section 6 demonstrate.

To analyse these dynamics, Max Weber's sociological tool of the "ideal type" (*Idealtypus*) is employed. Six ideal-type scenarios are developed across key sectors of the twin transition: urban mobility and transport, the platform and gig economy, rural energy and depopulation, digital public infrastructure and smart cities, digital agriculture, and urban renovation. Each scenario is structured around five analytical elements: (a) statistical vulnerabilities and structural profile; (b) mechanisms of exclusion; (c) disaffection and radicalisation dynamics; (d) the potential of community work and participatory governance to provide viable responses; and (e) specific policy recommendations.

2. Theoretical Framework: Ideal Types, Transition Justice, and Community Work

2.1. The Weberian Ideal Type as Analytical Tool

Max Weber's concept of the ideal type (*Idealtypus*) constructs an analytical model by accentuating the characteristic features of a social phenomenon. It is not a description of reality in its full complexity, but a conceptual tool enabling systematic comparison and explanation (Weber, 1949). In this article, ideal types construct prototypical profiles grounded in statistical evidence and analytically sharpened to reveal the essential mechanisms of exclusion. They also illuminate the "elective affinities" (*Wahlverwandtschaften*) between structural vulnerability and political disaffection: how precarity, exclusion, and perceived injustice create conditions of receptivity to populist and extremist narratives that instrumentalise grievances generated by the transition.

Ideal types are analytically constructed, not empirically observed, and their relationship to lived experience is necessarily partial. Real individuals frequently inhabit multiple scenarios simultaneously: A rural older adult woman may also be a gig-economy worker's dependent, and a peripheral urban worker may simultaneously face digital exclusion. The heuristic value of the method lies precisely in its deliberate analytical simplification, enabling systematic structural comparison that would be impossible through more holistic descriptive approaches (Weber, 1949). This epistemological self-awareness does not undermine the analysis but frames its proper scope.

The Weberian method has been applied productively in adjacent fields: Esping-Andersen's (1990) welfare state regime typology, Rubery's (1997) comparative employment models, and Wacquant's (2008) advanced marginality ideal type all deploy the same logic of constructing analytically sharpened models that reveal structural patterns not visible through purely empirical description. In transition governance research, this tradition offers an important advantage over vulnerability indices or capability approaches: It foregrounds the mechanisms through which exclusion is produced rather than merely its distributional outcomes, enabling identification of community-based interventions targeted at the process of exclusion rather than at its symptoms.

A central conceptual question is whether the "twin transition" constitutes a genuinely integrated structural transformation or two parallel processes that co-occur without necessary integration (Kovacic et al., 2024). We acknowledge this empirical debate: Available evidence suggests that, in most national contexts, green and digital transitions evolve under distinct institutional logics, driven by different policy communities and investment frameworks, and that their interactions are contingent rather than systemic (Gao, 2024; Kovacic et al., 2024). Our use of "twin" refers primarily to the EU policy framing (European Green Deal + Digital Compass 2030) that has structured the governance environment within which both transitions unfold simultaneously. The analytical contribution of this article is to examine how the compounded social costs of these two co-occurring structural transformations fall on the most vulnerable, regardless of whether their integration is ontological or merely political.

2.2. Transition Justice and the Distributive Dimension of Green and Digital Policy

The "just transition" framework has extended beyond coal communities facing deindustrialization (Morena et al., 2020; Snell, 2018) to encompass three justice dimensions: distributional justice (who bears costs and receives benefits), procedural justice (who participates in decision-making), and recognition justice (whose knowledge, values, and identities are acknowledged; McCauley & Heffron, 2018; Schlosberg, 2007).

Each of the six ideal-type scenarios can be mapped onto one or more of these justice dimensions, providing a theoretical thread that runs across the scenario analysis. Scenario 1 (Manuel) is primarily an instance of distributional injustice. Scenario 2 (Ana) combines distributional and procedural injustice. Scenario 3 (María) is primarily distributional and procedural, with a strong recognition dimension: Her knowledge, values, and rural identity are systematically disregarded by digitally mediated policy design. Scenario 4 (Pilar and Karim) is a case of procedural and distributional injustice: Algorithmic route optimisation produces distributional harm, and neither has any voice in the smart city governance that shapes their mobility. Scenario 5 (José and Lucía) is centrally a question of recognition justice: The twin transition implicitly delegitimises José's accumulated traditional agricultural knowledge. Scenario 6 (Sofía) involves all three dimensions simultaneously: distributional dispossession through eco-gentrification, procedural exclusion from renovation governance, and the non-recognition of existing community identity and social fabric.

2.3. Community Work as Democratic Counter-Practice

The structural mechanisms of exclusion identified above call for governance responses capable of addressing both their material and democratic dimensions. Against the technocratic and market-oriented logics that dominate twin-transition governance, community work offers an alternative model grounded in participatory democracy, asset-based community development, and the co-production of public goods (Banks, 2020; Gilchrist, 2019). In the context of the twin transition, it plays three interconnected functions: mediating transition costs for vulnerable groups; creating participatory spaces for co-designing inclusive transition pathways; and countering disaffection and extremism by providing constructive channels for grievances and building solidarity.

For analytical clarity, four modalities of community work are deployed across the scenarios (Banks, 2020; Gilchrist, 2019): (a) professional community work, involving trained practitioners who facilitate participatory processes with marginalized communities (prominent in Scenarios 3 and 6); (b) community organizing, understood as the collective self-mobilization of affected communities (central to Scenario 6); (c) cooperative economic models, including platform cooperatives, energy cooperatives, and technology commons, through which communities collectively own and govern productive assets (central to Scenarios 2, 3, and 5); and (d) co-design and participatory planning processes, through which communities contribute to the design of public infrastructure and policy (prominent in Scenarios 1, 4, and 5).

It is equally important to acknowledge the structural limitations of participatory governance. The empirical literature identifies several recurring challenges (Arnstein, 1969; Fung, 2006): low and unequal uptake, with the most marginalised groups least likely to participate without active outreach; institutional capture by better-resourced actors; the risk of tokenism, in which communities are consulted rather than genuinely empowered; and the tension between participation as a resource-intensive slow process and the technical

speed of transition implementation. Genuine co-governance—as distinct from consultation—requires sustained institutional support, legal recognition, and adequate resourcing of community organisations as governance actors.

2.4. Transition Precarity as an Analytical Concept

"Transition precarity" denotes the structurally induced condition of heightened vulnerability specifically produced or exacerbated by green and digital policy transitions, as distinct from pre-existing forms of socioeconomic precarity. While Guy Standing's "precariate" designates a class of workers characterised by insecure labour market position, absent occupational identity, and inadequate social protections (Standing, 2014), "transition precarity" refers to the additional layer of vulnerability imposed on already disadvantaged groups by the governance architecture of the twin transition itself: upfront capital requirements they cannot meet, digital literacy prerequisites they do not possess, administrative processes they cannot navigate, and territorial patterns of investment from which they are structurally excluded. Transition precarity may compound pre-existing precarity (as in Ana or María) or may affect groups not otherwise characterised by labour market precarity (as in José, whose agricultural knowledge is delegitimised by Common Agricultural Policy [CAP] digitalisation, or Sofía, whose community is displaced by green renovation).

3. Methodology

The six ideal-type scenarios were constructed through a secondary statistical analysis combined with a systematic literature review. Six sectors were selected to cover major EU twin-transition domains identified in EU policy frameworks: urban mobility and transport; the platform and gig economy; rural energy and depopulation; digital public infrastructure and smart cities; digital agriculture; and urban renovation. Statistical profiles were constructed from Eurostat, the Instituto Nacional de Estadística (INE), Eurobarometer surveys, and sector-specific administrative datasets (Dirección General de Tráfico; Ministerio de Agricultura, Pesca y Alimentación; Consorcio Regional de Transportes de Madrid). Exclusion mechanisms were identified inductively from the statistical and empirical literature on each sector, then organised deductively through the five-part Weberian analytical template.

The community-based responses included in each profile were identified through a systematic review of documented European practices in three areas: (a) community work and social intervention, drawing on the academic literature on participatory governance, asset-based community development, and co-production of public services (Arnstein, 1969; Banks, 2020; Fung, 2006; Gilchrist, 2019; OECD, 2023a, 2023b); (b) cooperative economic models, including platform cooperatives, energy cooperatives, and technology commons, drawing primarily on documented European cases and OECD comparative evidence (Coopcycle, 2026; OECD, 2023a, 2023b); and (c) participatory planning and co-design processes, drawing on documented EU urban mobility and renovation programmes (European Commission, 2021b; WeCount Consortium, 2022). The selection criterion for each response was demonstrable implementation in at least one European context, with preference given to cases documented in peer-reviewed literature or rigorous grey literature from reputable institutional sources.

The policy recommendations in each profile were derived directly from the exclusion mechanisms identified in the Weberian analytical template for that sector: each recommendation targets one or more of the

mechanisms listed in the corresponding table and is grounded in the same empirical and academic literature used to identify those mechanisms. They are therefore not prescriptive proposals external to the analysis, but operational implications of the structural diagnosis conducted within each ideal type. Their synthesis, into five higher-order governance principles, is developed in Section 5.

Community-based responses were identified from documented European practices in community work, cooperative economics, and participatory governance (Arnstein, 1969; Banks, 2020; Fung, 2006; Gilchrist, 2019; OECD, 2023a, 2023b). The limitations of this approach include: (a) the ideal types are Spanish-context constructions whose transferability to other EU contexts requires institutional adjustment; (b) reliance on secondary data means scenarios cannot capture subjective experience; and (c) analytically constructed types necessarily simplify the complexity of real social situations.

4. Six Ideal-Type Scenarios: Structural Exclusion and Community Responses

4.1. Ideal Type 1: Manuel—Metropolitan Periphery & Mobility Exclusion

Low-income peripheral worker, male, mid-career, adversely affected by Low-Emission Zone (LEZ) restrictions in a major urban area.

Manuel is a 52-year-old maintenance worker in Madrid's outer belt whose diesel vehicle, over 15 years old, has been restricted from the city-centre LEZ since 2023. Approximately 70% of vehicles over 15 years old in Spain are diesel, concentrated in lower-income households (Dirección General de Tráfico, 2023, 2024). The average new electric vehicle (EV) costs €37,000 versus €18,000 for a comparable second-hand petrol car (Asociación Española de Fabricantes de Automóviles y Camiones, 2025), and one-third of households below €18,000/year cannot afford replacement even with subsidies (Comisión Nacional de los Mercados y la Competencia, 2023). The Auto+ programme (formerly Plan MOVES III, Movilidad con Vehículos de Emisiones reducidas), in force since January 2026 as part of the Plan España Auto 2030, applies subsidies of up to €4,500 directly at the point of sale, removing the upfront payment barrier of its predecessor. However, with eligible vehicles capped at approximately €45,000, the programme remains structurally inaccessible for households with monthly incomes below €1,200, for whom even the post-subsidy price of a new EV exceeds several years of disposable income (Ministerio de Industria y Turismo, 2026). Public transport alternatives are inadequate: Outer Madrid average commutes exceed 90 minutes per trip (Consorcio Regional de Transportes de Madrid, 2018), producing "mobility poverty" (Kuttler & Moraglio, 2020) as a direct outcome of the green transition. Table 1 maps the five exclusion mechanisms identified in this scenario against the corresponding community-based responses.

Manuel's disaffection is structural, not ideological: He does not object to clean air in principle, but to a policy that imposes costs he cannot bear while offering benefits he cannot access. Climate scepticism is more prevalent among older, lower-income, and right-leaning populations (Fundación BBVA, 2026), and digital platforms systematically amplify conspiratorial content for users like Manuel (EU DisinfoLab, 2025), creating fertile ground for far-right movements that reframe these grievances as elite contempt for working-class mobility. Community-anchored mobility cooperatives and participatory LEZ governance can simultaneously address material harm and restore democratic inclusion (European Commission, 2021b; WeCount Consortium, 2022).

Table 1. Exclusion mechanisms and community entry points in the ideal type of metropolitan periphery and mobility exclusion.

Exclusion Mechanisms	Community-Based Responses
Old diesel car restricted from the city centre since 2023	Targeted income-conditioned mobility subsidies (no upfront)
Cannot afford EV replacement (€37,000 average)	Affordable green micro-mobility cooperatives (e-bikes)
Auto+ subsidies (up to €4,500) remain inaccessible: Vehicle price cap (~€45,000) far exceeds purchasing capacity	Participatory LEZ design with periphery residents
No viable public transport alternative (90+ min commute)	Expanded and subsidised electric bus network to the periphery
Inability to access transition support due to time poverty and administrative complexity	Community digital literacy to navigate institutional tools

The following measures are recommended:

1. Progressive reform of the Auto+ programme to introduce income-conditioned subsidy tiers for households below €18,000/year, including a dedicated low-income track with enhanced subsidy amounts and eligibility for affordable second-hand EVs;
2. Periphery transport investment mandate requiring metropolitan authorities to publish and remedy connectivity gaps;
3. Participatory LEZ design making resident consultation a legal prerequisite before expansion;
4. Green micro-mobility cooperatives providing shared e-bike access in underserved neighbourhoods;
5. Community digital literacy programmes funding critical media workshops in peripheral community centres.

4.2. Ideal Type 2: Ana—Precarious Gig Worker in the Digital Economy

Young precarious platform worker, female, urban, doubly excluded by digital algorithmic control and green mobility restrictions.

Ana is a 28-year-old food delivery rider in Barcelona with income fluctuating between €900–1,100/month (Hidalgo et al., 2024). Despite working 45–50 hours weekly for a single platform, she lacks sick leave, unemployment insurance, or maternity protection due to misclassification as self-employed (Mandl, 2021). Her entire employment relationship is mediated by algorithmic management with no transparency or negotiation (Agosti et al., 2024; Fairwork España, 2025). The green transition further compounds her vulnerability: Replacing an ageing combustion vehicle with an electric alternative requires €3,000–5,000, prohibitive given her income. Her situation is compounded by intersecting gender vulnerabilities: Women in the gig economy face income gaps relative to male peers, greater exposure to harassment in public spaces, and lower access to digital upskilling programmes (European Institute for Gender Equality, 2021). When the green transition additionally threatens her only productive asset through LEZ restrictions, the perception that the transition is designed against her becomes difficult to counter through purely discursive means.

Table 2 maps the five exclusion mechanisms identified in this scenario against the corresponding community-based responses.

Table 2. Exclusion mechanisms and community entry points in the ideal type of a young female precarious platform worker.

Exclusion Mechanisms	Community-Based Responses
Algorithmic management with no transparency or negotiation	Platform worker cooperatives with democratic governance
No labour rights: sick pay, maternity leave, pension	Platform cooperative development funds providing full employment contracts and social protection
Old motorcycle restricted by LEZ emission policies	Algorithmic transparency regulation and worker education
Income too low to replace vehicle with electric alternative	Collective bargaining support under the Riders' Law framework
Intersecting gender vulnerabilities in the gig economy	Gender-sensitive audits of gig economy regulation

Ana's disaffection manifests as political abstention, anomic cynicism, and horizontalist protest rather than far-right sympathies, but represents a significant legitimacy deficit for the twin transition. Only 46% of Europeans are confident sustainable goods will be affordable for all, and perceptions of fairness have declined sharply among young people (Eurobarometer, 2022a, 2022b) The platform cooperative model—worker-owned, democratically governed cooperatives replacing algorithmic control with collective governance and full employment contracts—has proven viable where municipal support addresses the structural obstacle of start-up capital (Christiaens, 2025; OECD, 2023a, 2023b).

The following measures are recommended:

1. Platform cooperative development funds providing municipal co-investment for worker-owned delivery cooperatives;
2. Fair mobility schemes designing specific EV subsidies for platform workers with deferred payment;
3. Algorithmic transparency obligations mandating intelligible explanations of pay and scheduling algorithms;
4. Funding community-based workshops on digital rights education, algorithmic governance and platform worker organising;
5. Intersectional policy audits requiring gender-sensitive impact assessments for all green mobility regulations affecting the gig economy.

4.3. Ideal Type 3: María—The Invisible Rural Pensioner

Older adult rural woman, low pension, energy-poor, digitally excluded, perceiving the urban ecological agenda as alien and hostile to her daily reality.

María is a 67-year-old widow in a village of fewer than 500 inhabitants in Castilla-La Mancha with a pension of €810/month, well below the national average ("La pensión media," 2024). She spends over 10% of her income on energy, exceeding the EU energy vulnerability threshold. In Spain, 20.8% of households could

not adequately heat their homes in 2023, with severe energy poverty hotspots concentrated in Castilla-La Mancha and Extremadura (Eurostat, 2024; Santos, 2025). Installing solar or heat pump systems requires €8,000–15,000 upfront investment (Instituto para la Diversificación y Ahorro de la Energía, 2026). Online-only subsidy applications exclude her by design: Around 20% of those aged 65–74 lack the digital skills to navigate such applications effectively (INE, 2024). Women over 65 are more likely to live alone, have lower pensions reflecting historical labour market exclusion, and face higher poverty risk—a compounded vulnerability mainstream transition policy has failed to address (EgaleCo Lab, 2025).

Table 3 maps the five exclusion mechanisms identified in this scenario against the corresponding community-based responses.

Table 3. Exclusion mechanisms generated by the twin transition and community entry points in the ideal type of an older adult rural pensioner.

Exclusion Mechanisms	Community-Based Responses
Energy expenditure exceeds 15% of pension income	Rural community energy cooperatives (collective solar)
Cannot afford solar or heat pump installation	Digital intermediaries ("digital warm experts") for elderly residents
Online-only subsidy applications exclude her by design	Mandatory offline application channels for all subsidies
Rural connectivity gap (83% vs 95% urban internet access)	Multi-service rural community hubs
Gendered pension gap: income below the national average	Rural representation quotas in green policy advisory bodies

Voting behaviour research shows that depopulating Spanish municipalities have recorded growing electoral support for radical right and rural-populist parties as a function of structural abandonment rather than ideology (Sánchez-García et al., 2025), a pattern Rodríguez-Pose and Bartalucci (2024) identify as a likely driver of "green discontent" in left-behind regions. The "España Vaciada" (Emptied Spain) narrative—representing depopulating rural and inland territories that feel systematically abandoned by the state—reflects genuine structural marginalisation that makes green transition promises seem hostile rather than supportive. Rural community energy cooperatives—piloted in Castilian municipalities with Liaison Entre Actions Développement de l'Économie Rurale programme support (EU CAP Network, 2026)—collectively eliminate individual capital barriers while distributing benefits equitably. The "digital warm expert" model (trained local intermediaries accompanying residents through applications) builds sustainable local capacity while respecting dignity (Alonso González et al., 2026; Bakardjieva, 2005; Hänninen & Taipale, 2025).

The following measures are recommended:

1. Rural community energy cooperatives with dedicated EU LEADER and PERTE (Proyecto Estratégico para la Recuperación y Transformación Económica; Ministerio de Industria y Turismo, 2021) funding;
2. Funding a digital warm expert programme to train and deploy community intermediaries in municipalities with above-average over-65 populations;
3. Universal offline access mandating paper/in-person applications for all public support programmes;

4. Multi-service rural hubs offering integrated energy, digital, health, and social services in municipalities under 1,000 inhabitants;
5. Rural representation in green governance through mandatory rural quotas in advisory bodies.

4.4. Ideal Type 4: Pilar and Karim—The Invisible Citizens of the Smart City in a City Without Tickets

Older adult woman without smartphone and precarious migrant worker, both structurally excluded by algorithmic public transport optimisation in a fully digitalised urban mobility system.

Pilar is a 78-year-old retired seamstress without a smartphone. Karim is a 34-year-old Moroccan–Spanish logistics worker dependent on peripheral bus lines for his multi-job commute. Both are adversely affected by Madrid's transition to digitalised public transport, including virtual ticketing via smartphone and planned account-based ticketing by 2027. Around 20% of those aged 65–74 lack digital skills to navigate transport applications effectively (INE, 2024). Demand-optimised transit planning deprioritises low-frequency peripheral routes serving working-class neighbourhoods, a form of algorithmic retrenchment flagged by the European Parliament as a driver of transport poverty (Berthereau, 2023; European Parliament, 2022). Karim's split-shift mobility needs do not conform to peak-demand patterns that algorithms optimise for, making the smart city's "efficiency" a de facto class logic. Algorithmic route optimisation systems, trained primarily on mobility data from higher-income and majority-population users, risk systematically undercounting the mobility needs of workers in peripheral employment (Benjamin, 2019; Eubanks, 2018).

Table 4 maps the five exclusion mechanisms identified in this scenario against the corresponding community-based responses.

Table 4. Exclusion mechanisms and community entry points in the ideal type of those affected by a ticketless urban transit system.

Exclusion Mechanisms	Community-Based Responses
No smartphone: excluded from digital-only payment systems	Hybrid payment systems (reloadable cards at local shops)
Peripheral bus lines cut by demand-optimisation algorithm	Community transport mapping of mobility dead zones
No voice in smart city design or route decision processes	Participatory neighbourhood transport planning
Migrant worker: additional language and documentation barriers	Multilingual community outreach and documentation support for migrant transport users
Multi-job split shifts invisible to algorithmic route planning	Community-led shift-pattern mapping to make split-shift mobility needs visible to transit planners

For Pilar, the elimination of physical tickets represents institutional contempt. For Karim, the algorithmic dismantling of peripheral bus lines confirms his structural invisibility to urban planners. Urban exclusion and infrastructural abandonment are among the strongest structural drivers of institutional distrust, particularly combined with ethnic minority status and precarious employment (Rodríguez-Pose, 2018; Wacquant, 2008). Community participatory transport mapping demonstrates that "efficiency" must be measured in social terms, not merely algorithmic optimisation of aggregate demand (Lucas et al., 2016; WeCount Consortium, 2022).

The following measures are recommended:

1. Hybrid digital-physical payment infrastructure mandating non-smartphone payment options as a legal accessibility requirement;
2. Participatory route impact assessments requiring community consultation before algorithmic route modifications;
3. Community UX co-design involving elderly, migrant, and low-income users in the design of all digital public interfaces;
4. Community-managed transport services piloting resident-governed minibus schemes for underserved peripheral routes;
5. Digital rights in urban planning law establishing statutory rights to non-digital access to all essential public services.

4.5. Ideal Type 5: José and Lucía—Generational Fracture in the Smart Farm

Traditional smallholder farmer versus young agro-tech cooperative manager, intergenerational knowledge conflict at the intersection of precision agriculture, EU environmental regulation, and rural social cohesion.

José is a 70-year-old Galician smallholder with 30 hectares, managing his land with inherited ecological knowledge. Lucía, 31, manages the local cooperative and is the primary interlocutor with EU funding institutions. The average age of Spanish farm operators is 61.4 years, with only 7.7% under 40—the lowest EU share among major agricultural countries (Eurostat, 2022; INE, 2022). Digital agriculture tools require capital investment prohibitive for small holdings: 63% of Spanish farms han an annual output below €15,000 (INE, 2022), making such investment structurally inaccessible. Three-quarters of farm operators have no formal agricultural training beyond practical experience (Ministerio de Agricultura, Pesca y Alimentación, 2022). The EU Farm to Fork Strategy and its implementation through the CAP 2023–2027 framework require digital record-keeping that, for José, represents not merely a technical burden but a delegitimisation of 50 years of accumulated expertise (European Commission, 2020, 2021a).

Table 5 maps the five exclusion mechanisms identified in this scenario against the corresponding community-based responses.

This scenario produces disaffection at the level of identity and dignity: The twin transition communicates to José that 50 years of accumulated knowledge are obsolete. Centro de Investigaciones Sociológicas (2024) data show farmers are the most right-leaning occupational group in Spain (mean ideological self-placement 6.2/10 vs. 4.9 general electorate), with Vox leading their voting intention at 29.8%—a pattern coinciding with far-right mobilisation of agrarian resentment against ecological policy (Romero, 2024; Ungureanu & Popartan, 2024). As a community-based response within this ideal type, Lucía's "just transition in the field" programme addresses this through reciprocal knowledge exchange: Elder farmers teach traditional ecological knowledge while younger members provide digital training and shared tool management, repositioning José's expertise as an asset to be actively sought and formally documented.

Table 5. Exclusion mechanisms and community entry points in the ideal type of generational fracture in the smart farm.

Exclusion Mechanisms	Community-Based Responses
Digital precision tools: capital cost €15,000–50,000 per holding	Technology commons cooperatives (shared precision tools)
CAP compliance requires digital record-keeping skills	Simplified and offline CAP compliance pathways for smallholders
EU regulations implicitly delegitimise traditional knowledge	Intergenerational knowledge exchange programmes and traditional knowledge documentation
Debt pressure on younger generation for equipment purchase	Cooperative credit schemes and collective equipment financing for smallholders
Generational conflict threatens family and community cohesion	Rural agroecology innovation hubs (multi-generational)

The following measures are recommended:

1. Technology commons cooperatives with dedicated EU and national funding for shared precision agriculture tools;
2. Intergenerational knowledge exchange programmes with formal recognition of traditional ecological knowledge;
3. Traditional knowledge documentation supporting community-based validation projects;
4. Simplified CAP compliance pathways developing offline routes for smallholders over 60;
5. Rural agroecology innovation hubs establishing multi-generational knowledge centres combining agroecological research with community education and cooperative business support.

4.6. Ideal Type 6: Sofía—Eco-Gentrification and the Dispossessed Community. The Green Eviction

Working-class woman, community organiser, single mother, facing displacement and loss of social fabric through eco-gentrification in a publicly funded zero-emission urban renewal zone.

Sofía is a 38-year-old single mother and neighbourhood association leader in an inner-city district declared a Zero-Emission Renovation Zone under an EU-backed programme funded through the Recovery and Resilience Facility. The programme includes mandatory energy retrofitting, pedestrianisation, creation of green spaces, and installation of community solar panels. On paper, a model of sustainable urban development. In practice, it has triggered acute eco-gentrification: Rental prices have risen substantially (Ministerio de la Vivienda y Agenda Urbana, 2026), consistent with the eco-gentrification dynamic whereby urban green investment drives displacement pressures on lower-income residents (Anguelovski et al., 2018; Gould & Lewis, 2017). Working-class businesses are displaced by organic food stores and co-working spaces, while lower-income long-term residents face systematic displacement as urban investment increases area desirability (López-Gay et al., 2021). Community land trust models have been identified as effective anti-displacement mechanisms in comparable contexts (Gould & Lewis, 2017).

Table 6 maps the five exclusion mechanisms identified in this scenario against the corresponding community-based responses.

Table 6. Exclusion mechanisms generated by the twin transition and community entry points in the ideal type of eco-gentrification and the dispossessed community.

Exclusion Mechanisms	Community-Based Responses
Green renovation triggers substantial rent increases	Community land trusts: non-profit perpetual affordable housing
Working-class businesses displaced by upmarket shops	Community-owned commercial spaces and local business protection agreements
Existing community not consulted on renovation design	Participatory co-design of renovation plans with existing residents as mandatory governance requirement
Energy retrofit investment benefits accrue to new owners	Participatory budgeting for green renovation funds
Resentment crystallises: "Your ecology is our eviction"	Right-to-return guarantees for displaced residents

Sofía's case illustrates a distinctive form of political mobilisation: not toward passivity or far-right radicalisation, but toward active resistance and counter-hegemonic community organising. The slogan "Your ecology is our eviction"—coined here to encapsulate the core grievance of communities experiencing eco-gentrification—captures the insight that green urban policies designed without community participation can become instruments of class dispossession, regardless of their environmental merits, creating a perverse feedback loop where just transition failures produce anti-ecological attitudes (Anguelovski et al., 2018; Checker, 2011; Gould & Lewis, 2017). Sofía's coalition of architects and housing rights lawyers develops a counterproposal on three pillars: a community land trust guaranteeing affordable rents in perpetuity; a community energy cooperative governing rooftop solar so benefits flow to existing residents; and co-designed public green spaces as urban allotments serving existing community needs.

The following measures are recommended:

1. Community land trust provisions mandated in all EU-funded urban renovation programmes;
2. Community energy governance requiring collective ownership of solar panels installed through public renovation programmes;
3. Urban allotments co-designed with existing communities;
4. Anti-displacement legal clinics providing free housing rights advice;
5. Participatory budgeting allocating a mandatory minimum of 20% of EU renovation funds to current residents;
6. Right-to-return guarantees for displaced residents at pre-renovation rental prices.

Table 7 synthesises the radicalisation pathways and community interruption points across all six scenarios.

Table 7. Radicalisation pathways and community interruption points across the six ideal-type scenarios.

Scenario	Structural Trigger	Disaffection Form	Radicalisation Risk	Community Interruption Point
1. Manuel Metropolitan periphery worker	LEZ restriction imposes direct cost on a marginal livelihood	Climate scepticism; green policy as class contempt	Far-right capture: green transition as elite aggression against working-class mobility	Mobility cooperatives restore material agency; participatory LEZ governance restores democratic inclusion
2. Ana Precarious platform worker	Algorithmic opacity denies voice and rights in the only employment available	Political abstention; anomic cynicism; horizontalist protest	Withdrawal from institutional politics; anti-platform and anti-green populism	Platform cooperatives replace algorithmic control with democratic governance; collective action rebuilds political efficacy
3. María Older adult rural pensioner	Cumulative exclusion: energy poverty, digital illiteracy, and geographic isolation	Green agenda perceived as urban imposition alien to rural life	Rural-populist mobilisation framing green transition as demographic contempt	Energy cooperatives provide material stake in transition; "digital warm expert" model restores dignified institutional access
4. Pilar & Karim Invisible citizens of the smart city	Algorithmic route optimisation and digital-only infrastructure produce invisibility	Institutional contempt confirming civic non-existence	Alienation from mainstream politics; susceptibility to anti-system narratives	Transport mapping makes invisible communities legible; hybrid payment systems restore material access
5. José & Lucía Generational fracture in the smart farm	Twin transition delegitimises traditional knowledge; EU compliance frames experience as obstacle	Identity wound: resentment at the perceived erasure of a lifetime of expertise	Agrarian far-right populism: EU technocracy framed as cultural war on rural livelihoods	Knowledge exchange repositions traditional expertise as asset; technology commons eliminates investment barrier
6. Sofía Eco-gentrification and the dispossessed community	Green renovation transfers value from existing residents to incoming capital	Counter-hegemonic resistance: active organising against displacement	Anti-green sentiment among natural transition allies; legitimacy crisis for environmental policy	Land trust and energy cooperative ensure benefits flow to existing residents; participatory governance converts residents into co-authors of renovation

5. Cross-Cutting Analysis: Structural Patterns Across the Six Scenarios

5.1. Common Mechanisms of Exclusion

Across the six scenarios, four common structural mechanisms of exclusion emerge consistently, regardless of sector or social profile:

1. The upfront cost barrier: All transitions require initial capital investment structurally inaccessible to low-income households. Subsidy programmes requiring upfront payment reproduce this barrier.
2. The digital literacy gateway: Public support programmes increasingly require digital access and literacy as a prerequisite for participation, systematically disadvantaging the elderly, rural populations, and recent migrants.
3. The geographic penalty: Green and digital transitions consistently generate better outcomes in dense urban centres than in peripheral or rural communities, amplifying existing territorial inequalities.
4. The knowledge disqualification: Transition policies implicitly delegitimise non-technological knowledge—traditional agricultural practices, collective urban memory, community governance experience—in favour of expert-driven and algorithm-mediated decision-making.

These four mechanisms map onto the three justice dimensions introduced in Section 2.2: The upfront cost barrier and geographic penalty are distributional failures; the digital literacy gateway combines distributional and procedural injustice; and the knowledge disqualification is centrally a recognition justice failure. Across all six scenarios, women in structurally equivalent positions face additional vulnerabilities through intersecting income gaps, care responsibilities, historical pension deficits, and greater exposure to displacement through eco-gentrification

5.2. The Radicalisation Pathway and Its Interruption

The six scenarios suggest a common pathway from structural exclusion to political disaffection that can, under certain conditions, culminate in radicalisation. The pathway moves through five stages: (a) material harm or perceived threat to livelihood; (b) institutional abandonment or perceived indifference; (c) narrative capture by far-right or populist movements that frame the transition as cultural contempt; (d) retreat into homogeneous digital information ecosystems that reinforce grievance; and (e) political radicalisation or withdrawal from democratic participation. Community work can interrupt this pathway at every stage: through material support, participatory governance, alternative narratives, and digital literacy.

It is essential to clarify that this pathway describes conditions of structural risk rather than causal necessity. Political radicalisation is a probabilistic outcome: The same material conditions can produce very different political responses depending on the availability of mediating institutions, local political cultures, and individual trajectories (della Porta, 2018; Norris & Inglehart, 2019). Community work functions precisely as such a mediating institution, redirecting structurally produced grievances toward constructive democratic channels, since the most effective radicalisation prevention addresses structural grievances directly rather than merely contesting extremist narratives (della Porta, 2018).

5.3. The Reactionary Instrumentalisation of Green Transition Grievances

A recurring dynamic across the scenarios is the instrumentalisation of green and digital transition policies by reactionary actors who reframe them as cultural aggression against working-class, rural, or older adults' populations. This reactionary narrative retains its purchase as long as the transition generates genuine uncompensated costs for the most vulnerable. Community work and participatory governance can delegitimise this framing by changing the material and institutional conditions that give it resonance.

The label "woke ecology," deployed by far-right and rural-populist actors in Spain and across Europe (Ungureanu & Popartan, 2024), is an emic construct belonging to the vocabulary of the actors being analysed, not to the analytical framework of this article. The argument advanced here is not that ecological transition policy is culturally imperialist, but that when it generates genuine and uncompensated costs for the most vulnerable, this reactionary label acquires political traction that community work and democratic governance must actively work to displace.

6. Recommendations: Toward Just and Inclusive Twin-Transition Governance

The six scenarios converge on a common diagnosis: The twin transition, as currently governed, was not designed with justice as a constitutive requirement. The scenario-level policy recommendations are operational responses to specific exclusion mechanisms; what follows synthesises them into five higher-order governance principles—architectural requirements without which no combination of sectoral measures will be sufficient.

6.1. The Precondition Principle: Distributional Justice Before Implementation

Across all six scenarios, transition costs fall on those least able to bear them before any compensatory mechanisms become available. The precondition principle requires that no major green or digital policy instrument enters into force without a prior mandatory distributional impact assessment. Where significant regressive effects are identified, income-conditioned and payment-deferred access mechanisms must be embedded in the instrument's design from the outset, not added retrospectively.

6.2. The Universality Principle: Non-Digital Access as a Fundamental Right

Every scenario involves some dimension of digital exclusion, yet public support programmes and compliance frameworks are being redesigned around digital access as if it were universal. The universality principle requires that the right to non-digital access to all essential public services and support programmes be legally established at EU and national levels, with hybrid online-offline pathways mandated for all instruments funded through Just Transition or Recovery and Resilience mechanisms. Community digital intermediaries (the "digital warm expert" model) represent the human infrastructure for operationalising this principle in the most excluded communities.

6.3. The Co-Governance Principle: Participation as Structural Requirement, Not Procedural Gesture

The communities most adversely affected by the twin transition are consistently those with the least voice in its design—the predictable outcome of a governance architecture in which participation means consultation rather than co-governance. The co-governance principle requires that genuine community participation, defined as meaningful influence over outcomes, be a legally enforceable prerequisite for EU co-funded transition projects: mandatory community representation in governance bodies, participatory budgeting for a minimum share of transition funds, and, where anti-displacement or anti-exclusion safeguards are absent.

6.4. The Anti-Dispossession Principle: Transition Benefits Must Flow to Existing Communities

Three scenarios reveal a mechanism of injustice beyond unequal cost distribution: The green transition actively dispossesses existing communities by transferring the value of their spaces to incoming capital—most clearly through eco-gentrification (Scenario 6), but also when energy renovation increases property values for landlords while tenants are displaced. The anti-dispossession principle requires that all EU-funded transition programmes include enforceable mechanisms ensuring benefits flow to the communities that host them: community land trust provisions, collective ownership requirements for publicly funded energy infrastructure, right-to-return guarantees, and community benefit agreements as conditions of public co-investment.

6.5. The Legitimacy Principle: Counter-Radicalisation Through Democratic Inclusion

The radicalisation pathway identified across the scenarios does not originate in ideology but in structural experience. The communities most vulnerable to far-right mobilisation are not those with pre-formed anti-ecological values but those whose legitimate grievances have not been addressed by democratic institutions. Tactical interventions (media literacy, counter-narrative campaigns, algorithmic audits) address symptoms without touching causes. The legitimacy principle holds that the most effective counter-radicalisation strategy is a transition that is materially just, procedurally inclusive, and culturally respectful. When transition governance meets these conditions, the narrative that the transition is an urban elite project imposed on the excluded loses its purchase. Community work and participatory governance are not soft complements to transition policy; they are the democratic foundation on which its political sustainability depends.

7. Conclusion: The Twin Transition We Need

The twin transition is not a natural process but a political one. Its outcomes—who benefits, who bears costs, and who is left behind—are not predetermined by technological necessity but shaped by governance choices. The six ideal-type scenarios developed in this article, grounded in Weberian methodology and Spanish statistical evidence, demonstrate that the current trajectory of green and digital transformation risks reproducing and deepening structural inequalities while generating new forms of exclusion that fuel political disaffection and, in the most acute cases, radicalisation. The four mechanisms of exclusion identified (the upfront cost barrier, the digital literacy gateway, the geographic penalty, and the knowledge disqualification) constitute a diagnostic framework applicable to any sector or social group affected by the twin transition.

Community work and participatory governance are not soft complements to the "hard" work of technical transition. They are its democratic foundation.

Technical transition governance produces outcomes—lower emissions, higher connectivity, more efficient energy systems—but cannot, by itself, produce legitimacy: the consent and active participation of communities whose lives are being restructured. Legitimacy derives not from the quality of outcomes alone but also from the procedural conditions under which decisions are made. When communities co-govern the transitions affecting them, they become authors rather than objects of the transition. Community work organisations are the institutional carriers of this democratic capacity: Recognising them as governance infrastructure—with stable funding, legal status, and formal roles in transition decision-making—is not a social policy desideratum but a structural requirement of just transition governance.

The scenarios draw primarily on Spanish statistical evidence and institutional context. Their transferability requires attention to conditioning factors. The four structural mechanisms are empirically documented across multiple EU member states and are therefore structurally general. However, the severity with which they manifest varies significantly across welfare state architectures. Southern and Eastern European member states—characterised by lower welfare state generosity, higher rates of informal employment, greater rural-urban inequality, and weaker traditions of participatory governance—represent the most directly comparable contexts. Nordic and Western European welfare states may already have institutional resources that partially mitigate some of the mechanisms described.

The heuristic value of the Weberian ideal-type framework can be precisely stated. First, it enables cross-sectoral comparison, making visible common exclusion mechanisms invisible within single-sector analyses. Second, it connects individual vulnerability to structural process: Ideal types reveal the mechanisms through which transition governance itself produces exclusionary outcomes, independently of individual characteristics. Third, it bridges analysis and prescription, making the framework directly actionable for policy and practice while connecting material conditions to political dynamics in a way that neither social policy analysis nor democratic theory typically achieves alone. These three analytical affordances distinguish the framework from existing approaches in the transition justice literature.

The path toward a just and inclusive twin transition requires a fundamental reorientation of governance: from technocratic efficiency toward democratic legitimacy, from market-led distribution toward redistributive justice, and from top-down implementation toward genuine co-production with the communities most affected. The transition will be just, or it will not be stable. The choice is ours to make, and urgently so.

Acknowledgments

The authors would like to acknowledge the support they received from Professors Kolotouchkina, Piqueiras, and Pavón.

Funding

This research was carried out as part of the FITTER-EU project, which has received funding from the European Union's Horizon Europe Research and Innovation Programme under Grant Agreement no. 101132546. Views and opinions expressed are those of the authors only and do not necessarily reflect

those of the European Union or the Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them. This research was also funded by the Ministerio de Ciencia, Innovación y Universidades (Spain), Grant no. PID2023-150587OB-I00, project Adopción de la Tecnología, Expertos Informales y Educación Digital en Adultos Mayores.

Conflict of Interests

The authors declare no conflict of interests.

LLMs Disclosure

The authors used Claude (Anthropic), ChatGPT (OpenAI), and RefWorks in the preparation of this manuscript. These tools assisted with: literature search and fact-checking of empirical claims and statistical data; verification and correction of bibliographic references; structural review and editorial suggestions; and improvement of academic English style and expression. All analytical content, theoretical argumentation, scenario construction, and interpretive judgements are the exclusive work of the authors. The authors take full responsibility for the accuracy and integrity of the published work.

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