# Voting against interest in the green transition? The geography of political incongruence in the Netherlands

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**Abstract**

Climate change and the green transition generate highly uneven costs and risks across households and places, yet political support for policies addressing these risks may not align with local exposure. This paper examines how material exposure to these costs and risks corresponds to political representation across Dutch neighborhoods. We combine fine-grained spatial indicators of energy poverty, housing quality, and climate-related hazards with neighborhood-level election outcomes. Political alignment is captured using a Policy Favorability Index (PFI), which measures party support for housing-level climate adaptation and redistributive energy transition policies, alongside two measures of political incongruence: a high-exposure–low-PFI quadrant classification and a continuous Interest–Vote Incongruence (IVI) index. Both measures reveal a strongly structured political geography. While exposure to energy costs and climate risks is widespread across urban and peripheral regions, political incongruence is concentrated in less urban and lower–human-capital areas. Regression analyses show that education and urbanity are the strongest correlates of alignment, outweighing income and wealth. These findings indicate that the green transition is filtered through an urban–rural and education-based political divide, posing challenges for building politically sustainable and socially just climate policy.

**Keywords:** Climate Policy, Green Transition, Spatial Inequality, Political Geography
**JEL-classification:** D72, D63, Q54, R11, R58

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# 1 Introduction

Climate change and the green transition impose costs and risks that are deeply uneven across space. Households living in poorly insulated dwellings, facing high energy bills, or exposed to flooding and land subsidence experience the transition not as an abstract environmental project, but as a set of concrete pressures on housing quality, household budgets, and long-term asset values (Mulder et al., 2023, 2025; Premchand et al., 2024). These forms of exposure cluster geographically, producing neighborhoods where climate and energy vulnerability are structurally high. Yet political support for the policies designed to address these risks—such as housing retrofits, adaptation measures, and redistributive financing of the transition—may not follow the same spatial pattern (De Voogd & Cuperus, 2021; Mason, 2018; Veenhof et al., 2025). As a result, climate hazards and green transition risks generate not only a geography of vulnerability, but also a geography of political representation in which some exposed places are better aligned with protective and redistributive climate policy than others (Lockwood, 2018; Rodríguez-Pose & Bartalucci, 2024).

Classical models of political economy suggest that such alignment should exist. In the Downsian tradition, voters are expected to support parties that maximize their material welfare, while economic voting models predict that exposure to risk increases demand for redistribution and social protection (Downs, 1957; Margalit, 2013). Applied to the green transition, this logic implies that neighborhoods facing high energy burdens, poor housing quality, and elevated climate risks should favor parties offering strong housing-level climate and redistribution policies (Bergquist et al., 2020; Mildenberger & Leiserowitz, 2017). At the same time, a large body of research shows that voting behavior is often shaped less by material self-interest than by symbolic politics, partisan identity, and place-based political loyalties (Bartels, 2006; Lau & Heldman, 2009; Sears & Funk, 1990). Climate and energy policy, in particular, has increasingly become bound up with cultural and territorial identities, raising the possibility that exposure and political representation may diverge in systematic ways across space.

This paper brings these perspectives together by asking how exposure to the green transition aligns with political representation across space and which socioeconomic characteristics shape that alignment. We do so in two steps. First, we map the geography of political incongruence by combining neighborhood-level indicators of climate change and energy-related exposure with a Policy Favorability Index (PFI) that captures how strongly political parties support housing-level climate adaptation and energy costs redistribution. This makes it possible to identify where highly exposed neighborhoods are represented by parties that offer weak or regressive climate adaptation and energy transition policies. Second, we examine which neighborhood characteristics are systematically associated with this incongruence, focusing in particular on education, urbanity, income, wealth, and welfare dependence. By applying a political-economy framework of representation and congruence to the localized costs of climate change and the green transition, we show how climate risks and the green transition are politically mediated across space

The results reveal a sharply structured political geography of the green transition. Although exposure to high energy burdens, poor housing quality, and climate-related risks appears in both major metropolitan areas and more peripheral regions, political incongruence—neighborhoods that combine high exposure with low policy favorability—clusters primarily in less urban and lower–human-capital areas. This pattern is strongest for energy-related indicators such as high energy burdens (HE) and low energy quality (LEQ) dwellings, which capture the daily regressive pressures of the transition on household budgets and housing conditions. By contrast, neighborhoods exposed to environmental hazards, such as flooding and land subsidence, show a more mixed alignment with political support, reflecting their concentration in wealthier and more urban regions. We also show that the overall level of policy favorability has declined between 2021 and 2023 and remains lower in 2025, indicating a weakening of political support for housing-level climate and redistribution policies over time. Together, these findings suggest that the green transition is increasingly filtered through an urban–rural and education-based political cleavage.

The remainder of the paper proceeds as follows. Section 2 outlines and discusses existing political theories and mechanisms of (in)congruent voting behavior. Section 3 describes the measurement and construction of several indicators, and the empirical strategy to examine the socioeconomic determinants of spatial (in)congruence. Section 4 reports the results, and Section 5 discusses our findings and concludes.

## 2 Political mechanisms of (in)congruent voting

This section explains the political mechanisms that may cause neighborhoods facing environmental and energy exposure to vote for parties whose platforms (do not) serve their material interests. We articulate three complementary perspectives: (1) material-interest voting, (2) symbolic politics and identity, and (3) spatial inequality and protest voting in the postindustrial economy.

### 2.1 Material-interest voting

Classic models of electoral behavior begin from a simple but powerful assumption: voters try to maximize their material welfare. In the Downsian framework, citizens compare the expected benefits of different parties' policies and choose the option that yields the highest utility (Downs, 1957). Much of the economic voting literature builds on this idea, showing that individuals reward or punish political actors on the basis of their personal finances and perceived economic security (Kinder & Kiewiet, 1979; Lewis-Beck & Paldam, 2000). More recent political-economy research extends this logic by arguing that demand for redistribution and social insurance rises with individual exposure to economic risk (Rehm, 2009), while economic shocks increase support for compensation and protection (Margalit, 2013). In this tradition, voting should align with one's material interests: when a policy materially helps you, you should prefer the party that offers it.

Environmental and energy exposure is simply another form of economic risk in this rhetoric. Research shows that individuals exposed to heat, droughts, and other climate hazards often express greater support for climate policy and adaptation measures (Hoffmann et al., 2022). Similarly, studies on the social bases of energy transitions indicate that households facing the highest energy burdens tend to support policies that reduce energy costs or improve housing efficiency (Bergquist et al., 2020). Exposed groups, in other words, may respond politically when risks and costs become salient and concrete.

Climate and energy positions of different parties are captured in this paper through the Policy Favorability Index (PFI), which measures how strongly each party's platform protects and supports environmental- and energy-exposed households. If rational voting behavior dominates, we would expect neighborhoods with high exposure to disproportionately support parties with higher PFI scores. Under material-interest voting, exposure should therefore be associated with greater congruence between interests and electoral choice. Highly exposed neighborhoods should vote for the parties that would most benefit them materially.

### 2.2 Symbolic politics and identity

Although classical models predict that voters align their choices with their material interests, decades of research also show that economic self-interest often plays a surprisingly limited role in political behavior. Symbolic politics theory argues that citizens typically rely on deep-seated identities, predispositions, and affective orientations rather than on calculations of personal benefits (Sears et al., 1980). Partisanship, ideology, and group identity act as perceptual filters shaping how individuals interpret information and which parties they see as representing "people like us." Empirical work consistently finds that these symbolic attachments frequently outweigh objective economic considerations (Lau & Heldman, 2009; Sears & Funk, 1990). More recent research strengthens this critique. Bartels (2006) shows that voters often act against their material interests when partisan loyalties or elite cues conflict with self-interest. Achen and Bartels (2016) argue that democratic politics is shaped primarily by "group and identity loyalties," not by policy evaluation. Mason (2018) further demonstrates that affective polarization—strong emotional identification with one's own party and hostility toward opponents—makes vote choice increasingly expressive and identity-driven rather than benefiting one's material interests.

Climate and energy issues are especially vulnerable to symbolic interpretation. Studies find that climate change has become a central axis of cultural conflict: partisan and ideological identities strongly shape perceptions of climate risk and evaluations of climate policy (Stokes & Warshaw, 2017). Climate and environmental policies often carry meanings unrelated to their distributive implications——signaling cosmopolitanism versus traditionalism, expert-led governance versus common-sense pragmatism, or urban environmentalism versus rural interests. As a result, voters may evaluate climate policies as cultural markers rather than as tools for reducing their physical or financial risks.

This mechanism can generate substantial incongruence between exposure and vote choice. A neighborhood facing high energy burdens or environmental hazards may still support parties offering weak climate adaptation or regressive financing if those parties resonate with local identities, cultural values, or partisan alignments. Conversely, neighborhoods with low exposure may support ambitious climate policies because such positions are symbolically tied to progressive or cosmopolitan identities. When voting becomes an expressive act——an affirmation of "who we are"—material self-interest loses predictive power. Under this mechanism, symbolic and identity-driven politics can sustain high levels of interest–vote incongruence.

### 2.3 Spatial inequality and protest voting in the postindustrial economy

While symbolic politics explains why individual voters may prioritize identity over material self-interest, these mechanisms are not evenly distributed across space. They are amplified in places undergoing long-term economic decline, status loss, and institutional detachment (De Voogd & Cuperus, 2021; Dijkstra et al., 2020). As manufacturing declined and economic value concentrated in high-skilled, knowledge-intensive sectors, many regions and neighborhoods experienced long-term stagnation, population decline, deteriorating public services, and diminishing political voice. This uneven restructuring produced what the literature describes as the geography of discontent: spatially concentrated economic and symbolic disadvantage, also known as the left behind places (Dijkstra et al., 2020; McCann, 2020; Rodríguez-Pose, 2018).

The rise of the knowledge economy fundamentally altered the relationship between class, place, and politics. In the postwar industrial era, large segments of the working class were tied into stable political coalitions. In the new economy, the growing returns to education create a new cleavage between the credentialed winners of the knowledge economy and those with limited access to high-skilled mobility (Ford & Jennings, 2020; Kitschelt & Rehm, 2014; Lockwood, 2018). For many communities outside metropolitan regions, the labor market increasingly offers low-wage, precarious jobs while removing traditional routes to economic and social status. This erosion of status has powerful political consequences. The downward social status—real or perceived—fuels resentment, alienation, and a sense of political abandonment (Gidron & Hall, 2017). Communities that feel culturally devalued or ignored by national institutions often gravitate toward anti-establishment or populist parties as a way of asserting dignity or recognition (Gidron & Hall, 2020). In these contexts, voting becomes less about policies and more about expressing anger or demanding respect.

These spatial and cultural dynamics intersect strongly with climate politics. Environmental and energy policies are often associated with urban, highly educated constituencies. For neighborhoods that feel overlooked, these policies can appear distant or imposed. Even adaptation and redistribution—despite their clear material benefits—may be framed by populist parties as another domain where national elites set priorities misaligned with local realities, resulting in the rejection of environmental and energy polices among this group (Huber, 2020; Lockwood, 2018). Under these conditions, exposed neighborhoods may not demand protective climate policy at all. Instead, voting may operate as a protest against institutions perceived as unresponsive or elitist.

This mechanism produces the opposite expectation from material-interest voting: higher exposure may correlate with greater interest–vote incongruence. In places shaped by long-run decline, distrust, and institutional detachment, exposure can reinforce feelings of abandonment rather than motivate support for the parties that promise the most help. Incongruence under these conditions is not a failure of addressing one's material interests, but a reflection of deeper patterns of spatial inequality, status loss, and protest against the political establishment.

# 3 Data & Methodology

This section describes the measurement and construction of the key variables used in the empirical analysis: neighborhood-level exposure to the green transition, the Policy Favorability Index (PFI) on housing-related climate and redistribution policy, and the Interest-Vote Incongruence (IVI) index. Data sources are introduced alongside the variables they underpin. Subsequently, we describe the empirical strategy to determine which socioeconomic factors correlate with incongruent voting behavior at the neighborhood level.

## 3.1 Exposure

We define exposure to the green transition as the extent to which households face high energy costs and climate-related hazards. Table 1 summarizes the measures we use in this paper. We derive indicators on household energy burdens from Mulder et al. (2023). These include the share of households facing a high energy burden (HE), and the share of dwellings with low energy quality (LEQ). A household is identified as having a high energy burden (HE) when its energy expenses exceed the median energy bill within its own housing class in the base year 2019. A dwelling is considered to be of low energy quality (LEQ) if its expected energy consumption exceeds the average expected energy consumption of dwellings with an average energy label C in the base year 2019. To reflect the social dimension of energy vulnerability, we also use two interaction measures: the share of households that are both low-income and face a high energy burden (LIHE), and the share of households that are both low-income and live in low-energy-quality dwellings (LILEQ). These indicators identify neighborhoods where energy transition pressures are concentrated among economically vulnerable households.

Environmental exposure is measured using two indicators that capture physical risks to the housing stock. Land subsidence measures the average rate of ground level change in millimeters per year, reflecting structural risks to buildings and infrastructure. TNO Geological Survey of the Netherlands models these subsidence rates. Flood risk is measured as a categorical hazard-exposure class based on national flood-risk maps, capturing the probability and severity of inundation.

Later on in the paper, we use normalized values of the exposure indicators to compare exposure levels to each other and to construct the IVI index. We use the same method as Mulder et al. (2025) for the normalization process, where they use a lower and upper threshold value. This method avoids outliers that skew the data too much. Equation 3.1 expresses the method mathematically. Table 1 reports the thresholds used to normalize the data [1].

$$\text{Normalized exposure} = \frac{X_{\text{actual value}} - X_{\text{lower threshold}}}{X_{\text{upper threshold}} - X_{\text{lower threshold}}} \tag{1}$$

[1] For now, we have used cutoff values at around the 10th and 90th percentiles to define a cutoff for outliers. We are still looking for a better substantiated method, based on cutoff values as defined by the literature.

Table 1: Exposure variables and definitions.

| Variable | Description | Unit | Thresholds | |
|---|---|---|---|---|
| | | | Low | High |
| HE | High Energy Burden | % | 10 | 80 |
| LEQ | Low Energy Quality House | % | 2 | 80 |
| LIHE | Low Income, High Energy Burden | % | 1 | 10 |
| LILEK | Low Income, Low Energy Quality | % | 1 | 10 |
| Subsidence | Rate of Land Subsidence | mm/y | 1 | 3 |
| Floods | Flood Hazard Exposure Class | class | 0 | 5 |

### 3.2 Policy Favorability Index

To capture how favorable parties are to a *just climate and energy transition* at the housing level, we construct a Policy Favorability Index (PFI) at the party level. The index measures, for each party $p$, the extent to which its manifesto for the Dutch general election advances (i) protection of the housing stock against climate risks, and (ii) redistribution of the costs and benefits of the transition in favor of low- and middle-income households, tenants, and socially vulnerable groups. The focus is explicitly on policies that directly affect dwellings, the residential environment, and household energy bills, rather than on generic climate policy related to decreasing emissions.

Existing expert-coded datasets, such as the Chapel Hill Expert Survey (CHES), contain party positions on different themes. However, these surveys do not contain the required level of granularity for our purposes. They measure general climate policy positions (e.g., environmental protection and climate ambition) and broad economic redistribution stances. They do not identify dwelling-level mitigation policies (insulation and heat pumps), climate adaptation in the built environment, and distribution of transition costs by income group and tenure type. Because our analysis centers explicitly on housing-level climate and redistribution policy, CHES seems too generic for this purpose.

The construction of the PFI requires a detailed reading of party manifestos, but we do not code every manifesto line-by-line from scratch. Instead, we rely on a hybrid workflow. First, we use existing systematic program comparisons (HIER, DGBC, Armoedefonds, CPB, NVDE/Atriensis) as our empirical foundation. Second, we complement these sources with an auxiliary document-reading step using a large language model (LLM, OpenAI's ChatGPT). The LLM is used strictly as a tool to scan manifesto texts for relevant sections, extract and summarize policies related to housing-level climate, energy, and redistribution, and help verify whether external syntheses accurately reflect manifesto content. The LLM autonomously determines scores on several aspects, as we deem this is more objective than human interpretation. All substantive judgments, coding decisions, and final assignments of the 0–5 dimensional scores are manually checked by the authors for accuracy. This ensures transparency, reproducibility, and human accountability. As such, the PFI should be interpreted as a carefully argued but ultimately indicative expert coding rather than a fully automated content analysis.

The PFI distinguishes four dimensions:

1. **H – Home retrofitting and obligations (mitigation at the dwelling level)**: insulation, heat pumps, phasing out gas, new-build standards, obligations for landlords, building-attached finance, and area-based retrofitting.
2. **P – Energy poverty and the energy bill**: structural policies to tackle energy poverty, social energy tariffs, permanent hardship funds, neighbourhood insulation programmes in energy-poor areas, and income-targeted support.
3. **A – Adaptation and climate risks in the built environment**: climate checks in spatial planning, climate-resilient building norms, urban greening, and area-based adaptation in exposed neighbourhoods.
4. **D – Distribution of transition costs and benefits**: the degree to which climate and energy policy is progressive, recycling of revenues to low-income households, and net impacts on poverty.

Each dimension is scored on a discrete 0–5 scale for every party $p$:

- 0: no or regressive policy,
- 1: symbolic or purely generic measures (e.g. broad tax cuts without targeting),
- 2: modest commitment (voluntary/generic subsidies and loans, no structural or legal change),
- 3: serious commitment (substantial package with attention to low incomes/tenants or exposed areas, but limited legal anchoring),
- 4: strong/structural policy (structural programs and targeted support for vulnerable groups),
- 5: very strong/transformative policy (legal anchoring, large public investments, and explicit linkage between climate policy, housing policy, and redistribution).

These anchor points are defined for each dimension. They allow consistent scoring across parties and a transparent interpretation of what constitutes "strong" or "weak" policy. In a stricter research design, one would use multiple independent coders and assess inter-coder reliability, but given the purpose of this analysis, the PFI is treated as a carefully argued but ultimately indicative index.

For each party $p$, we obtain four scores $H_p$, $P_p$, $A_p$, and $D_p$ in the range $[0, 5]$. The total score is:

$$\mathrm{Score}_p = H_p + P_p + A_p + D_p, \tag{2}$$

Which is normalized to the unit interval:

$$\text{PFI}_p = \frac{\text{Score}_p}{20} \in [0, 1]. \tag{3}$$

All four dimensions are weighted equally in the baseline specification. We repeat the analysis of PFI scores for every national election year. Table 2 reports the resulting PFI scores for all parties represented in the 2023 parliament.

Neighborhood-level electoral outcomes come from the Dutch Electoral Council (Kiesraad), which reports the number of votes for each party at the level of polling stations. We aggregate these to CBS neighborhoods and compute for each neighborhood $n$ the share of votes per party $p$.

Given party-level $\text{PFI}_p$ scores at the neighborhood level, we define the neighborhood's average policy favorability as the vote-share-weighted mean:

$$W_n = \sum_p S_{np} \times \text{PFI}_p. \tag{4}$$

This captures the extent to which the neighborhood's electoral choices support parties with favorable housing-related climate and redistribution policies.

Even the most favorable party may not score fully on all domains. Therefore, we normalize $W_n$ by the most favorable party available in the party system. This indicates how a neighborhood scores relative to the most favorable party:

$$PFI_n = \frac{W_n}{U_{\max}}. \tag{5}$$

Where $U_{\max}$ denotes the highest party-level PFI score.

By construction, $PFI_n \in [0, 1]$. A value of $PFI_n = 1$ indicates full support: the neighborhood exclusively supports the party (or parties) with the most favorable PFI score. A value of $PFI_n = 0$ indicates full opposition: the neighborhood exclusively supports the least favorable party. Intermediate values correspond to mixed support.

In the empirical analysis, we interpret the PFI as a measure of *housing-level climate and redistribution favorability*: higher values indicate that a party offers more ambitious and more redistributive policies to protect the housing stock and to shield vulnerable households from climate and energy risks. Our PFI can be applied to create indices for any type of policy by introducing other scoring domains. The methodology can be replicated to determine how favorable a party scores on other policy objectives.

### 3.3 Measuring incongruence and the IVI Index

The next step is to construct a measure for incongruent voting behavior. We use two measures of incongruence. The first measure is a binary indicator based on a quadrant system. We split the exposure variables and the PFI index on their medians. This allows for the construction of a quadrant measure, where the quadrants represent (I) low exposure, low PFI; (II) low exposure, high PFI; (III) high exposure, low PFI; and (IV) high exposure, high PFD. Quadrant (III) contains all neighborhoods with incongruent voting behavior. These neighborhoods are largely exposed to the green transition, but vote for parties less likely to support housing-level climate and redistribution policies.

Subsequently, we also try to quantify the degree of incongruence. For this, we construct an Interest-Vote Incongruence (IVI) index. The IVI index measures incongruence by taking the difference between a neighborhood's exposure to environmental or energy exposure and the favorability of the policies embodied in its electoral choices. The logic follows standard practice in political behavior research, where congruence is conceptualized as the distance between citizens' material conditions and the policies they support (Downs, 1957; Giger & Klüver, 2016). Exposure represents the material need for protective or redistributive housing-related climate policy, while the neighborhood-level PFI quantifies the actual policy favorability of the vote outcome. Taking the difference, therefore, captures whether political choices fall short of, match, or exceed what would be expected based on objective exposure:

$$IVI_{nt} = E_{nt} - PFI_{nt}. \tag{6}$$

Where $E$ denotes exposure to environmental hazards or facets of household energy burdens, which has been normalized on a scale of 0 to 1 with minimum and maximum thresholds (see Section 3.1. $IVI$ denotes the Interest-Vote Incongruence index at the neighborhood level, where we make different indices for each exposure indicator. If exposure exceeds the policy favorability of the supported parties, the IVI is positive—indicating incongruence or "voting against interest." If the two values align, IVI is close to zero, indicating congruence. If policy favorability exceeds exposure, IVI becomes negative, capturing over-support for protective policies relative to material need. Subtraction thus provides a transparent and theoretically grounded way to quantify misalignment between objective exposure and political behavior.

### 3.4 Empirical Strategy

The empirical objective is to identify which neighborhood socioeconomic characteristics are associated with incongruent voting behavior. We estimate models for two outcomes: (i) a binary indicator that equals one if a neighborhood exhibits incongruent voting and zero otherwise, and (ii) a continuous Interest–Vote Incongruence (IVI) measure. For the binary outcome, we use a logistic regression, while for the IVI measure, we estimate a linear model by ordinary least squares (OLS).

Let $Z_{nt}$ denote a vector of neighborhood socioeconomic characteristics obtained from CBS neighborhood statistics, including (among others) income, wealth, age composition, educational attainment, and population density. We also include year fixed effects, $\phi_t$, to absorb unobserved year-specific factors common to all neighborhoods.

For the binary incongruence indicator, $I_{nt} \in \{0, 1\}$, we estimate:

$$\Pr(I_{nt} = 1) = \Lambda(\beta_0 + Z'_{nt}\beta + \phi_t) \,, \tag{7}$$

where $\Lambda(\cdot)$ is the logistic cumulative distribution function.

For the continuous IVI index, we estimate:

$$IVI_{nt} = \alpha_0 + Z'_{nt}\alpha + \phi_t + \varepsilon_{nt}. \tag{8}$$

In both specifications, coefficients capture associations between neighborhood characteristics and incongruent voting outcomes. Positive coefficients indicate that higher values of a given characteristic are associated with greater incongruence, while negative coefficients indicate the opposite.

In the next section, we present descriptive statistics for the constructed variables and estimate Equations 7 and 8.

# 4 Results

This section presents the results of the key variables: exposure, the party policy favorability index (PFI), and the Interest–Vote Incongruence (IVI) index, followed by the estimation results based on Equations 7 and 8.

## 4.1 Exposure

Exposure to the green transition exhibits strong and systematically different spatial patterns across the Netherlands. Figure 1 shows that energy- and environment-related exposure are highly unevenly distributed and follow distinct, though partly overlapping, geographic gradients.

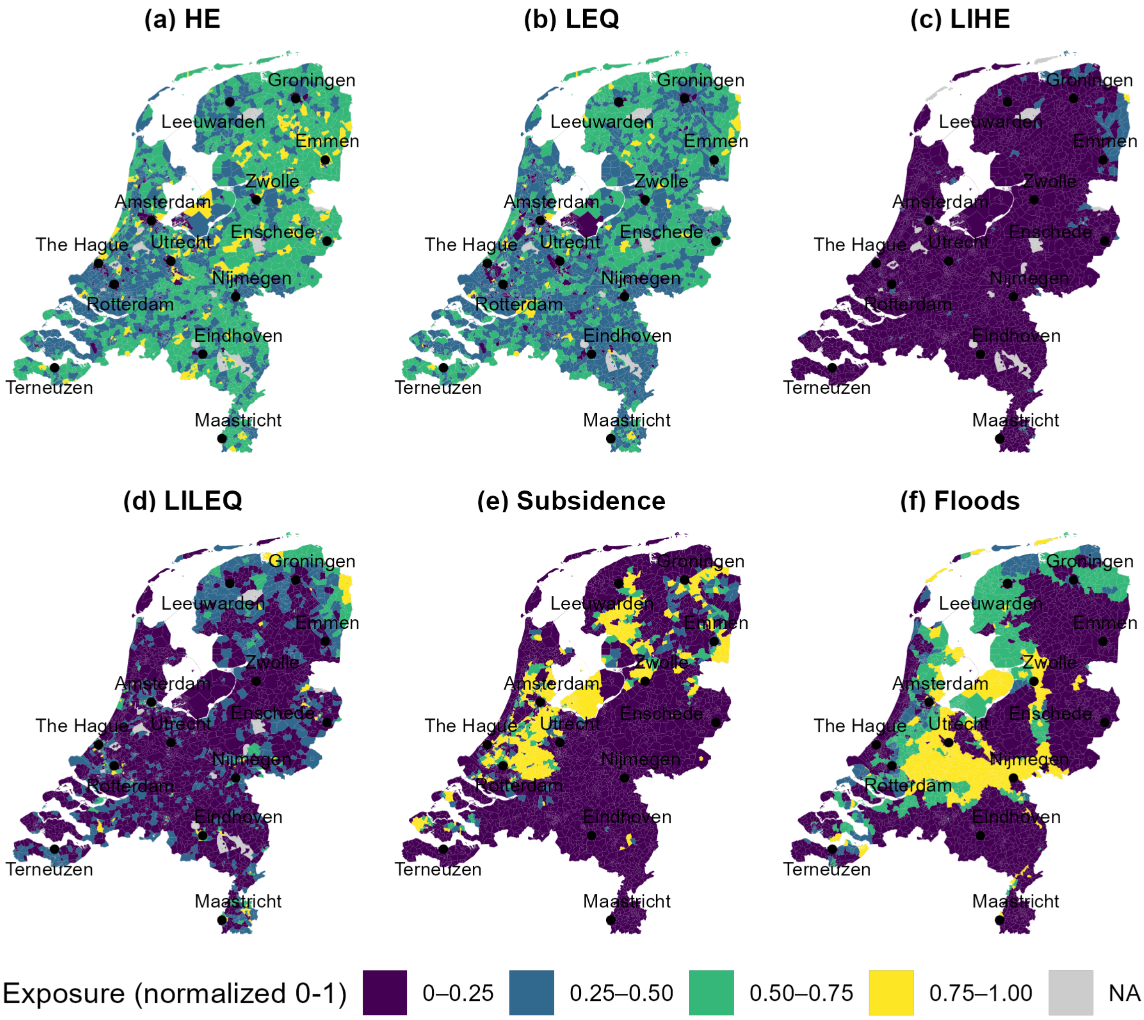


Figure 1: Exposure to high energy burdens and climate hazards.

Exposure to the energy transition—measured by housing-energy exposure (HE and LEQ) and their low-income variants (LIHE and LILEQ)—exhibits a pronounced dual spatial pattern. High exposure is concentrated not only in peripheral and post-industrial regions, but also within major urban centers. HE and LEQ capture the overall energy burden across the housing stock, while their low-income variants highlight where this burden falls disproportionately on financially vulnerable households. In the periphery, particularly in the north-east around Groningen, in Zeeland around Terneuzen, in South Limburg around Maastricht, and across large parts of the eastern Netherlands, high exposure reflects an aging and poorly insulated housing stock combined with relatively low incomes. At the same time, elevated exposure is also visible in large cities such as Amsterdam, Rotterdam, The Hague, and Utrecht, where dense concentrations of older pre-war and social housing create substantial vulnerability to rising energy costs and the requirements of housing decarbonization.

Environmental exposure—captured by flood risk and land subsidence—follows a more geographically concentrated pattern. High levels of risk are clustered in the western and northern parts of the Netherlands, including the Randstad, the river delta, and the northern peat and clay regions. These areas encompass both the country's largest metropolitan regions and long-standing low-lying agricultural landscapes, reflecting the historical development of the Netherlands as a densely settled delta. Environmental risk is therefore deeply embedded in the urban and economic core of the country, rather than being confined to its periphery (Premchand & Mulder, 2025; Premchand et al., 2024).

### 4.2 Policy Favorability Index (PFI)

The Policy Favorability Index (PFI) reveals a clear and highly structured ordering of Dutch political parties with respect to housing-level climate and redistribution policy. Table 2 shows a pronounced gradient for the 2023 elections, running from strongly redistributive, pro-household green-transition platforms to parties that place most adjustment burdens on households or leave them largely unaddressed.

Table 2: Dutch party scores for the 2023 election on housing-level climate and redistribution policies.

| Partij | H | P | A | D | Total | PFI |
|---|---|---|---|---|---|---|
| GroenLinks–PvdA | 5 | 5 | 5 | 5 | 20 | 1.00 |
| Volt | 5 | 5 | 4 | 4 | 18 | 0.90 |
| ChristenUnie | 4 | 5 | 4 | 4 | 17 | 0.85 |
| Partij voor de Dieren | 5 | 4 | 4 | 4 | 17 | 0.85 |
| SP | 4 | 5 | 3 | 4 | 16 | 0.80 |
| D66 | 4 | 4 | 4 | 3 | 15 | 0.75 |
| NSC | 3 | 4 | 3 | 4 | 14 | 0.70 |
| DENK | 3 | 4 | 2 | 4 | 13 | 0.65 |
| SGP | 2 | 4 | 3 | 4 | 13 | 0.65 |
| CDA | 3 | 3 | 3 | 3 | 12 | 0.60 |
| BBB | 2 | 1 | 2 | 2 | 7 | 0.35 |
| VVD | 2 | 1 | 2 | 1 | 6 | 0.30 |
| JA21 | 1 | 1 | 1 | 0 | 3 | 0.15 |
| PVV | 1 | 1 | 0 | 0 | 2 | 0.10 |
| FVD | 0 | 0 | 0 | 0 | 0 | 0.00 |

Parties like GroenLinks–PvdA, Volt, ChristenUnie, Partij voor de Dieren, SP, and D66 all score above 0.75 and reside at the top of the distribution. These parties combine ambitious climate and housing policies with explicit mechanisms for shielding households—particularly low- and middle-income groups—from the costs of decarbonization, flood protection, and high energy bills. Their platforms emphasize social housing, progressive cost sharing, and targeted compensation for vulnerable homeowners and tenants. At the opposite end, VVD, BBB, JA21, PVV, and FVD cluster well below 0.40. These parties either reject strong housing-level climate policies, rely primarily on market mechanisms, or avoid redistribution across income groups and regions. In this part of the political space, exposure to climate hazards and energy costs is largely treated as a private responsibility rather than a collective one. Together, these scores define a politically meaningful cleavage between parties that frame the green transition as a social project and those that frame it primarily as an economic adjustment.

Figure 2 maps the PFI scores at the neighborhood level for the 2021, 2023, and 2025 elections. A striking and persistent spatial pattern emerges. High-PFI neighborhoods—those voting for parties with strongly redistributive green-transition platforms—are heavily concentrated in and around the major metropolitan regions, including Amsterdam, Utrecht, Rotterdam, The Hague, and their surrounding commuter belts. In contrast, low-PFI neighborhoods dominate much of the rural periphery, including large parts of the north-east, Zeeland, eastern Brabant, and Limburg.

This geography is remarkably stable over time, although the general trend shows that the Netherlands is getting more conservative over time. This is especially pronounced between 2021 and 2023. The relative ranking of neighborhoods and regions remains largely intact: the urban core and its surrounding suburbs consistently vote for parties that favor protective and redistributive climate policy, while the more peripheral rural regions vote for parties that offer substantially less household-level protection.

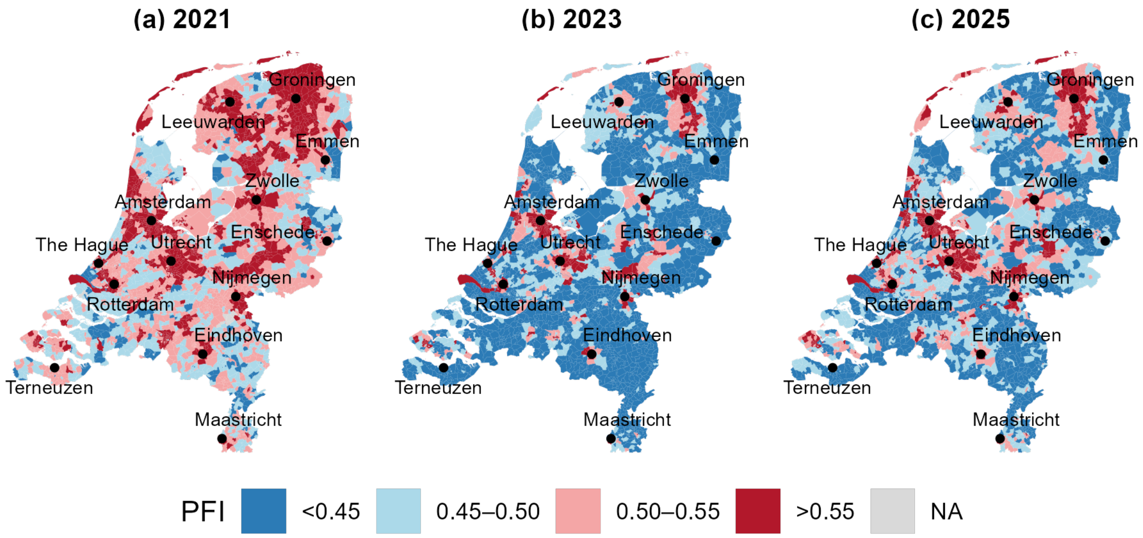


Figure 2: Policy favorability index (PFI) of the Dutch elections in 2021, 2023, and 2025.

### 4.3 Voting Incongruence

We combine neighborhood-level exposure to the green transition with the Policy Favorability Index (PFI) to describe how political representation aligns with material risk across space. In the first measure of incongruence, each neighborhood is assigned to one of four quadrants, split at the median of both exposure and PFI: high exposure–high PFI, high exposure–low PFI, low exposure–high PFI, and low exposure–low PFI. Neighborhoods in the high-exposure–low-PFI quadrant are defined as politically incongruent: they face high transition costs while voting for parties offering limited protection.

Figure 4 shows the joint distributions of exposure and PFI. For all energy-related indicators (HE, LEQ, LIHE, and LILEQ), the quadrants show a slighly negative association between exposure and PFI. Neighborhoods with higher energy burdens and poorer housing quality tend to vote for parties with lower policy favorability. The pattern is slightly the reverse for environmental risks (subsidence and flood hazard). Here, exposure is weakly positively associated with PFI: more exposed neighborhoods tend to vote slightly more for protective parties.

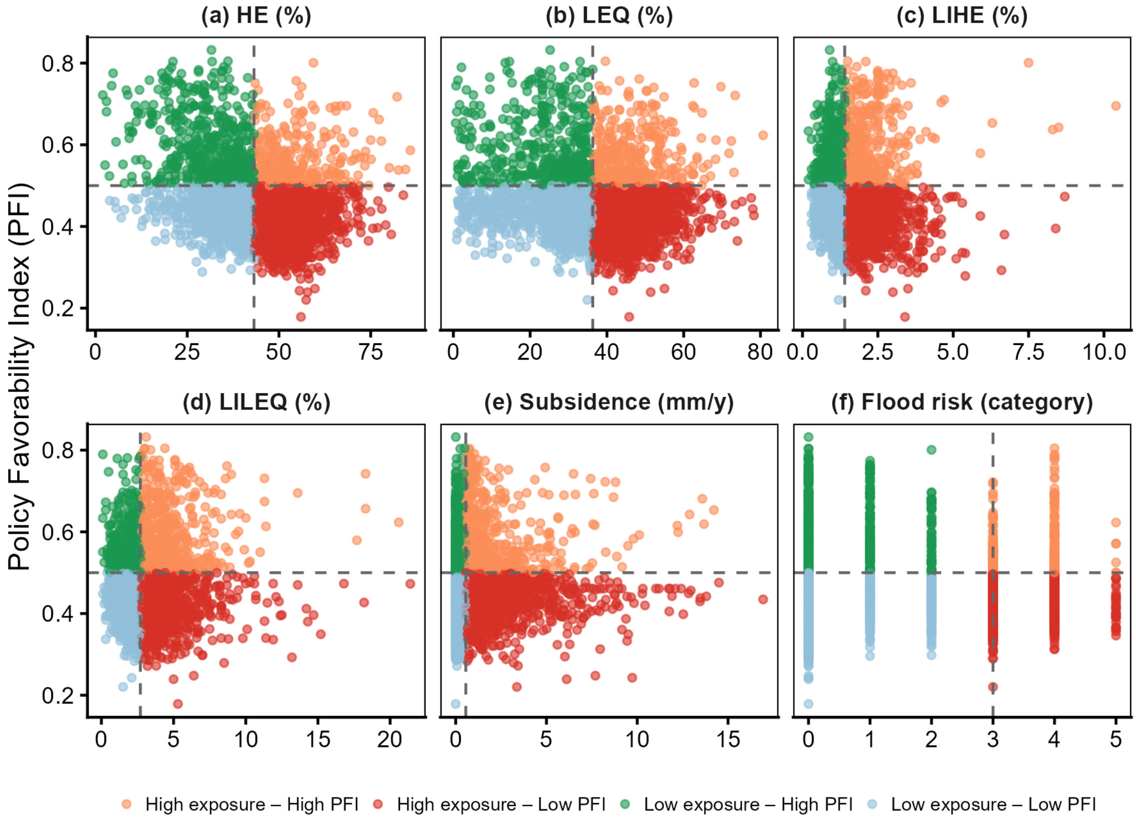


Figure 3: Quadrants split by median exposure and policy favorability index for 2023 elections.

Table 3 shows that incongruence is increasing over time. About 9.0 to 17.8% of all neighborhoods belonged to the high exposure, low PFI score quadrant in 2021. These shares increased to 28.2 to 40.1% in 2023, and they remain high in 2025 with 22.1 to 33.6%. These shares are especially high for the HE and LEQ variables, indicating high energy bills and a low energy quality dwelling. Most strikingly, the share of neighborhoods in the low exposure, high PFI quadrants was relatively high in 2021. This means that people living in low-exposure neighborhoods were still in favor of redistributive policies, whereas this pattern flipped around in the subsequent years.

Table 3: Distribution of neighborhoods across exposure–PFI quadrants.

| | Share of neighborhoods (%) | | | |
|---|---|---|---|---|
| | Low exposure | | High exposure | |
| | Low PFI | High PFI | Low PFI | High PFI |
| **HE** | | | | |
| 2021 | 9.4 | 40.9 | 17.8 | 31.9 |
| 2023 | 33.7 | 16.6 | 40.1 | 9.6 |
| 2025 | 27.1 | 23.0 | 34.8 | 15.1 |
| **LEQ** | | | | |
| 2021 | 10.0 | 40.1 | 17.1 | 32.7 |
| 2023 | 35.5 | 14.7 | 38.3 | 11.5 |
| 2025 | 28.4 | 21.9 | 33.6 | 16.2 |
| **LIHE** | | | | |
| 2021 | 15.6 | 35.7 | 11.6 | 37.1 |
| 2023 | 36.8 | 13.9 | 37.1 | 12.2 |
| 2025 | 34.4 | 16.9 | 27.6 | 21.2 |
| **LILEQ** | | | | |
| 2021 | 15.6 | 34.6 | 11.5 | 38.2 |
| 2023 | 40.4 | 11.3 | 33.5 | 14.9 |
| 2025 | 33.2 | 17.4 | 28.7 | 20.6 |
| **Subsidence** | | | | |
| 2021 | 15.5 | 34.5 | 11.9 | 38.1 |
| 2023 | 38.8 | 11.2 | 35.6 | 14.4 |
| 2025 | 33.2 | 16.9 | 28.5 | 21.4 |
| **Flood risk** | | | | |
| 2021 | 18.3 | 46.3 | 9.0 | 26.3 |
| 2023 | 46.2 | 18.5 | 28.2 | 7.1 |
| 2025 | 39.6 | 25.0 | 22.1 | 13.3 |

*Notes*: Quadrants are split at the median of exposure and PFI score.

Figure 4 reveals that the geography of political incongruence differs sharply between energy- and environment-related risks. For all four energy indicators, large and contiguous clusters of high-exposure–low-PFI neighborhoods dominate the north-east (including much of Groningen and Drenthe), Zeeland around Terneuzen, South Limburg, and wide parts of the eastern Netherlands. These areas combine poor housing quality and high energy burdens with low support for parties offering redistributive or protective green-transition policies. The resulting red swaths form a coherent peripheral belt, extending well beyond isolated municipalities and cutting across provincial boundaries. In contrast, low-exposure–high-PFI neighborhoods cluster strongly in and around the major metropolitan regions. Amsterdam, Utrecht, the City of Groningen, and parts of the central Netherlands display dense concentrations of politically over-represented neighborhoods, often in suburban and commuter belts surrounding the urban cores.

Environmental exposure exhibits a more heterogeneous spatial pattern. Flood- and subsidenceprone neighborhoods are spread across both urban and rural regions, including large parts of the western delta and northern peatlands. These areas are also systematically associated with low PFI scores. However, many highly exposed neighborhoods—particularly those in large urban cities—also display relatively high policy favorability, producing a more balanced mix. This reveals a striking pattern: especially rural neighborhoods with a high exposure show incongruent tendencies, whereas urban regions vote more in line with their material interests at similar exposure levels.

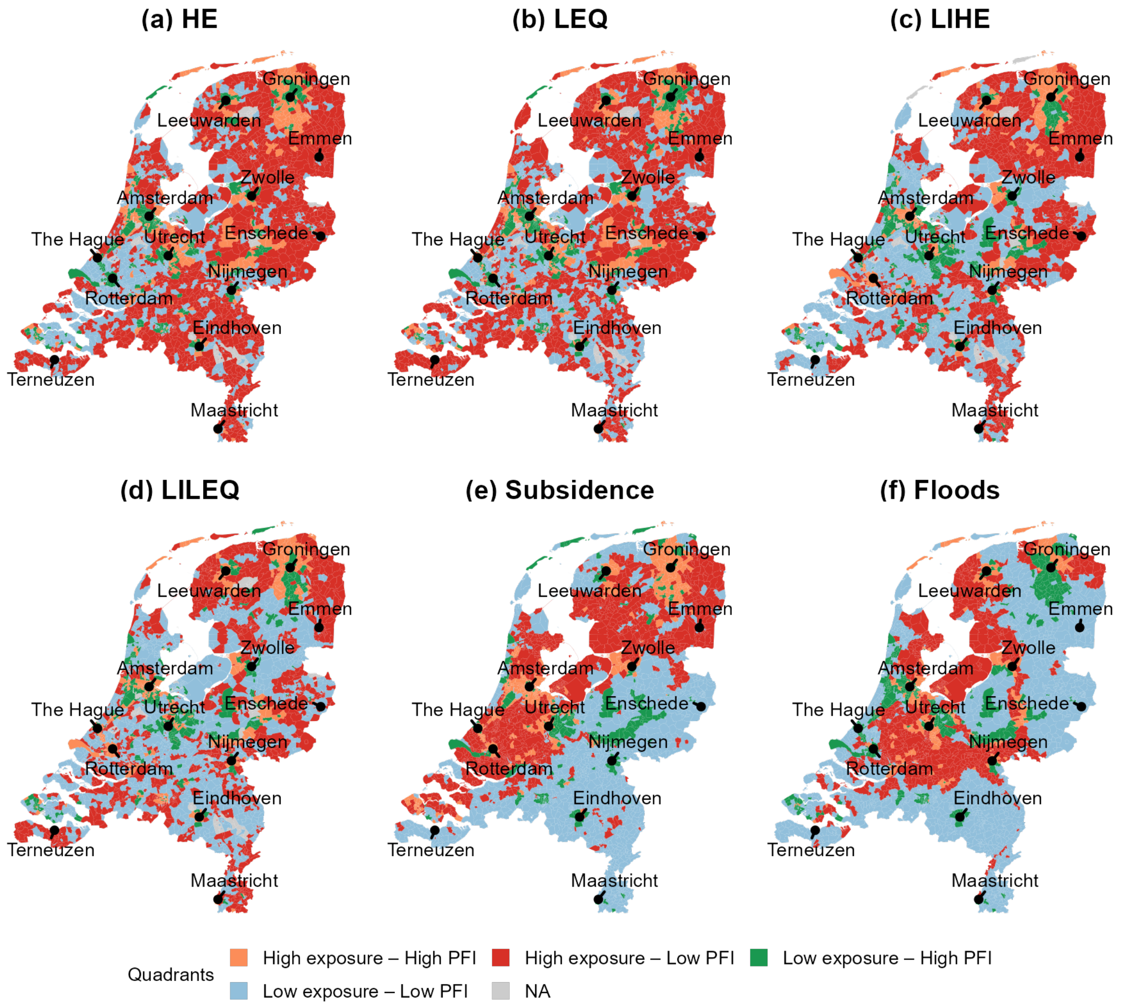


Figure 4: Quadrant maps split by median exposure and policy favorability index for 2023 elections.

Figure 5 maps the continuous Interest–Vote Incongruence (IVI) index across the Netherlands for all six exposure indicators. Positive values indicate under-representation—neighborhoods whose exposure exceeds the policy favorability of the parties they support—while negative values indicate over-representation.

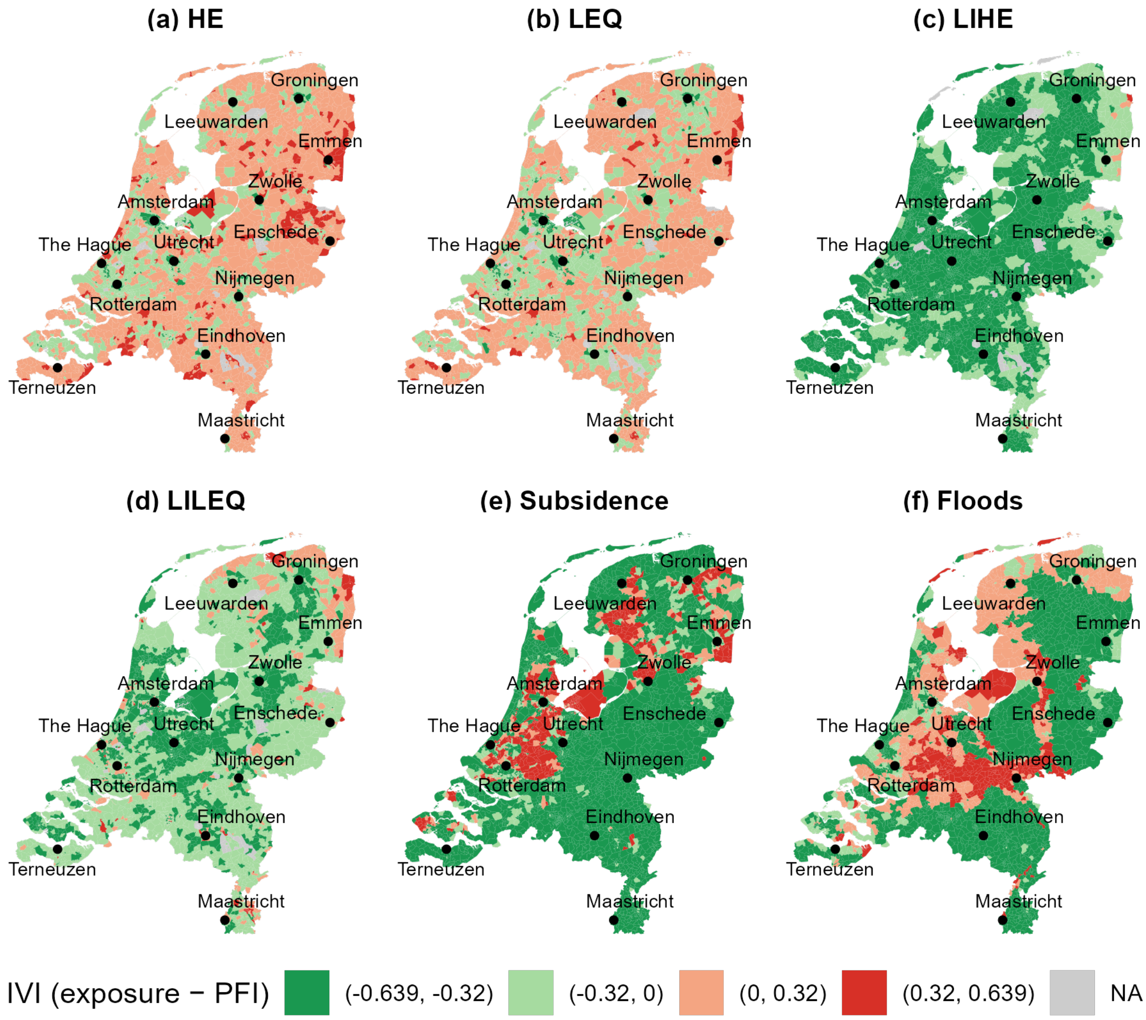


Figure 5: Interest-Vote Incongruence across the Netherlands in 2023.

A clear and highly structured geography emerges, which highly overlaps with the high exposure, low PFI neighborhoods. For all four energy-related indicators (HE, LEQ, LIHE, and LILEQ), large and contiguous areas of positive IVI dominate the national periphery. Strong under-representation is especially visible in the north-east (Groningen, Drenthe, and parts of Friesland), Zeeland, South Limburg, and broad parts of the eastern Netherlands. These regions combine high housing and energy exposure with systematically low PFI, producing persistent positive IVI scores. By contrast, the urban core and its surrounding commuter belts—particularly in Amsterdam, Utrecht, and parts of central Netherlands—are characterized by negative IVI values, indicating that these areas vote for parties offering more protection than their material exposure would imply.

The environmental IVI maps display a more heterogeneous pattern. Flood- and subsidence-related incongruence is spread across both urban and rural regions, with moderate positive IVI appearing in parts of the river delta, the western Netherlands, and the northern peatlands. Taken together, the IVI maps reinforce the central spatial asymmetry of the green transition. Energy- and housing-related risks generate a pronounced geography of political under-representation concentrated in peripheral regions, while environmental risks are more evenly matched by political support across the country.

### 4.4 Regression Results

Tables 4 and 5 examine which neighborhood characteristics are systematically associated with political incongruence. Table 4 models the probability that a neighborhood falls into the high-exposure–low-PFI quadrant, while Table 5 explains the continuous Interest–Vote Incongruence (IVI) index. Both specifications include year fixed effects, demographic controls, and sectoral structure, so the estimates capture persistent cross-sectional differences between neighborhoods rather than short-term electoral swings.

Table 4: Socioeconomic and spatial determinants of incongruence (logit model)

| Dependent variable:<br>High exposure, low PFI | (1)<br>HE | (2)<br>LEK | (3)<br>LIHE | (4)<br>LILEK | (5)<br>Subsidence | (6)<br>Flood |
|---|---|---|---|---|---|---|
| Income (percentile) | $-0.025$ | $0.010$ | $-0.037^{**}$ | $0.033^{*}$ | $0.224^{***}$ | $0.113^{***}$ |
| | (0.018) | (0.017) | (0.018) | (0.017) | (0.018) | (0.018) |
| Wealth (percentile) | $0.145^{***}$ | $0.108^{***}$ | $-0.025^{**}$ | $-0.034^{***}$ | $-0.139^{***}$ | $-0.094^{***}$ |
| | (0.011) | (0.010) | (0.010) | (0.010) | (0.010) | (0.011) |
| Highly educated (%) | $-0.131^{***}$ | $-0.153^{***}$ | $-0.058^{***}$ | $-0.082^{***}$ | $-0.152^{***}$ | $-0.132^{***}$ |
| | (0.009) | (0.009) | (0.008) | (0.008) | (0.008) | (0.009) |
| Urban density (1000 inh./km$^2$) | $-0.220^{***}$ | $-0.085^{***}$ | $-0.067^{***}$ | $-0.061^{***}$ | $0.009$ | $-0.198^{***}$ |
| | (0.031) | (0.023) | (0.019) | (0.019) | (0.018) | (0.022) |
| Social housing (%) | $-0.022^{***}$ | $-0.016^{***}$ | $0.022^{***}$ | $0.030^{***}$ | $-0.021^{***}$ | $-0.010^{*}$ |
| | (0.006) | (0.005) | (0.005) | (0.005) | (0.005) | (0.006) |
| Unemployment benefits (%) | $0.332^{***}$ | $0.103$ | $0.248^{***}$ | $0.198^{***}$ | $0.092$ | $0.084$ |
| | (0.072) | (0.063) | (0.068) | (0.068) | (0.073) | (0.071) |
| Social benefits (%) | $-0.093^{*}$ | $-0.063$ | $-0.161^{***}$ | $-0.145^{***}$ | $-0.077$ | $-0.042$ |
| | (0.051) | (0.039) | (0.039) | (0.041) | (0.047) | (0.043) |
| Pension benefits (%) | $-0.043^{**}$ | $0.007$ | $-0.001$ | $-0.001$ | $0.020^{***}$ | $0.005$ |
| | (0.020) | (0.005) | (0.011) | (0.005) | (0.006) | (0.006) |
| Distance to Amsterdam (km) | $0.011^{***}$ | $0.005^{***}$ | $0.009^{***}$ | $0.011^{***}$ | $-0.019^{***}$ | $-0.025^{***}$ |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Peat soil (=1) | $-0.403^{*}$ | $-0.287$ | $-0.811^{***}$ | $0.185$ | $0.347^{*}$ | $0.124$ |
| | (0.242) | (0.230) | (0.294) | (0.236) | (0.191) | (0.193) |
| Peat soil × Dist. Amsterdam | $0.001$ | $0.000$ | $0.011^{***}$ | $-0.001$ | $0.012^{***}$ | $0.008^{***}$ |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Demographic controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sectoral structure | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 8937 | 8937 | 8931 | 8934 | 8948 | 8948 |

*Note:* Logit coefficients with standard errors in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Across all six exposure dimensions, the most consistent correlates of incongruence are education and urbanity. Highly educated neighborhoods are significantly less likely to be politically incongruent and display systematically lower IVI scores. In both tables, the coefficients on the share of highly educated residents are large, negative, and highly significant. This implies that, at comparable levels of exposure, neighborhoods with more education tend to support parties offering stronger household-level protection. Urban density shows a similarly robust pattern.

Dense urban neighborhoods are less likely to fall into the high-exposure–low-PFI quadrant and exhibit lower IVI. This holds for all energy-related indicators and for flood risk. Together, these results indicate that political alignment with protective climate policy is strongest in highly educated, urban environments.

Table 5: Socioeconomic and spatial determinants of climate–political incongruence

| Dependent variable: IVI | (1) HE | (2) LEK | (3) LIHE | (4) LILEK | (5) Subsidence | (6) Flood |
|---|---|---|---|---|---|---|
| Income (percentile) | 0.002** | −0.002*** | −0.002*** | −0.004*** | 0.015*** | 0.012*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) | (0.002) |
| Wealth (percentile) | 0.012*** | 0.011*** | −0.001 | −0.002*** | −0.009*** | −0.010*** |
| | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Highly educated (%) | −0.007*** | −0.007*** | −0.004*** | −0.001*** | −0.007*** | −0.013*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) |
| Urban density (1000 inh./km$^2$) | −0.007*** | −0.005*** | −0.002** | −0.003*** | 0.000 | −0.021*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Social housing (%) | −0.001*** | −0.002*** | 0.002*** | 0.003*** | −0.002*** | −0.002*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) | (0.001) |
| Unemployment benefits (%) | 0.022*** | 0.010*** | −0.003 | −0.002 | 0.012* | −0.016** |
| | (0.003) | (0.003) | (0.003) | (0.004) | (0.007) | (0.007) |
| Social assistance (%) | −0.009*** | −0.003* | 0.019*** | 0.013*** | −0.007* | 0.004 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.004) | (0.004) |
| Pension benefits (%) | 0.000 | 0.000 | −0.001*** | −0.001*** | 0.002*** | 0.001** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.001) |
| Dist. Amsterdam (km) | 0.001*** | 0.000*** | 0.001*** | 0.001*** | −0.002*** | −0.003*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Peat soil (=1) | −0.026*** | −0.033*** | 0.006 | 0.010 | 0.673*** | 0.142*** |
| | (0.009) | (0.011) | (0.011) | (0.013) | (0.022) | (0.022) |
| Peat soil × Dist. Amsterdam | 0.000** | 0.000*** | 0.000 | 0.000 | 0.001*** | 0.001* |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Demographic controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sectoral structure | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 8937 | 8937 | 8931 | 8934 | 8948 | 8948 |

*Note:* OLS coefficients with standard errors in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Income and wealth display a more nuanced relationship. Wealthier neighborhoods are consistently less incongruent, with lower probabilities of falling into the high-exposure–low-PFI quadrant and lower IVI values. Income shows weaker and sometimes opposite patterns, reflecting the fact that income and wealth capture different dimensions of socioeconomic position in the Dutch housing market. Indicators of welfare dependence point in the opposite direction. Neighborhoods with higher shares of unemployment benefits and social assistance tend to be more incongruent for the energy indicators, indicating that financially vulnerable areas are more likely to combine high exposure with low political protection. Pension benefits, by contrast, show weaker and more mixed associations.

Distance to Amsterdam provides a powerful summary of the spatial dimension of incongruence. Across all specifications, neighborhoods located further from the urban core are significantly more likely to be politically incongruent and display higher IVI. This pattern is especially strong for energy-related exposure, reinforcing the peripheral geography seen in Figures 4 and 5. Peat soil, which proxies regions with structurally weak subsurface and higher long-term environmental risk, is associated with lower incongruence in several specifications. However, its interaction with distance to Amsterdam is positive and significant for energy exposure, indicating that peripheral peat regions become increasingly under-represented as one moves further away from the metropolitan core.

Taken together, the regression results show that political incongruence in the green transition is not random. It is systematically concentrated in neighborhoods that are less educated, less urban, and more peripheral, even after controlling for income, wealth, and welfare exposure. Conversely, highly educated and urban areas are the most likely to support redistributive and protective climate policies. These patterns mirror the spatial structure observed in the quadrant and IVI maps and underscore that the green transition in the Netherlands is embedded in a deeply stratified political geography.

## 5 Discussion & Conclusion

This paper set out to map how material exposure to the green transition aligns with the political representation of housing-level climate risks and energy cost redistribution policies across the Netherlands. By combining fine-grained neighborhood indicators of energy poverty and climate hazards with a Policy Favorability Index (PFI) derived from party platforms, we constructed two complementary measures of political (mis)alignment: a quadrant classification of high-exposure–low-PFI neighborhoods and a continuous Interest–Vote Incongruence (IVI) index that captures the distance between exposure and the policy content of the vote. Across both measures, a clear and highly structured spatial pattern emerges. While exposure to high energy burdens, poor housing quality, and environmental risks appears in both major metropolitan areas and peripheral regions, political incongruence is overwhelmingly concentrated in the rural periphery. This pattern is especially pronounced for energy-related indicators such as high energy burdens (HE) and low-energy-quality dwellings (LEQ), whereas environmental exposure displays a more mixed alignment with political support.

Beyond its spatial structure, incongruence in the Dutch green transition is also shaped by a marked temporal shift in the political supply of protective housing-level climate policy. Between the 2021 and 2023 elections, the average Policy Favorability Index (PFI) across neighborhoods declined sharply, reflecting the growing electoral dominance of parties offering weaker or more regressive climate and redistribution platforms. This shift coincides with the rise of parties such as the PVV, which became the largest political force in 2023, and it remains visible—though somewhat attenuated—in the 2025 results. While the relative ranking of neighborhoods and regions in terms of policy favorability is remarkably stable over time, the overall level of support for ambitious and redistributive housing-level climate policy has fallen. As a result, neighborhoods that were previously aligned with protective policy platforms increasingly find themselves represented by parties offering less support for households facing rising energy costs and climate-related housing risks.

A striking feature of the results is that exposure alone does not determine where political incongruence arises. High energy burdens, poor housing quality, and environmental risks are present both in large metropolitan areas—such as Amsterdam, Rotterdam, and Utrecht—and in more peripheral regions, including East Groningen, Friesland, Zeeland, South Limburg, and large parts of the eastern Netherlands. Yet political incongruence, as captured by both the high-exposure–low-PFI quadrants and the IVI index, is overwhelmingly concentrated in the latter group of regions. Major cities, despite often facing comparable or even higher levels of housing and energy exposure, tend to vote in line with their material interests by supporting parties with more favorable housing-level climate and redistribution platforms. This pattern is consistent with the coexistence of the three mechanisms outlined in Section 2. In more urban and institutionally embedded regions, material-interest voting is more likely to dominate (Downs, 1957; Margalit, 2013; Rehm, 2009), whereas in less urban and more politically detached regions symbolic politics and spatial inequality play a larger role in shaping how similar exposure levels are translated into political support (Achen & Bartels, 2016; Dijkstra et al., 2020; Mason, 2018; Rodríguez-Pose, 2018).

The regression results show that education and urbanity are the strongest and most consistent correlates of political incongruence: neighborhoods with higher shares of highly educated residents and greater urban density are significantly less likely to combine high exposure with low policy favorability and exhibit lower IVI values, even after controlling for income, wealth, welfare dependence, sectoral structure, and year fixed effects. This directly maps onto the symbolic-politics and spatial-inequality mechanisms outlined in Section 2. Education and urban embeddedness are closely associated with institutional trust, cosmopolitan identities, and alignment with progressive climate and redistribution agendas, whereas less urban and less highly educated regions are more likely to support parties that frame climate and energy policy as an imposition by distant elites rather than as collective insurance (Achen & Bartels, 2016; Lockwood, 2018; Mason, 2018). This divide overlaps closely with the geography of left-behind places: many of the regions with the highest energy-related incongruence—such as East Groningen, Zeeuws-Vlaanderen, South Limburg, and parts of the eastern Netherlands—have experienced long-term deindustrialization, weaker labor markets, and declining public services (De Voogd & Cuperus, 2021; van Meeteren & Smit, 2025). In such contexts, material exposure is filtered through territorial inequality in voice and recognition, so that hardship is more likely to translate into political detachment than into support for redistributive climate policy, consistent with Rodríguez-Pose's account of places that "don't matter" (Rodríguez-Pose, 2018).

Beyond its substantive findings, this study contributes a scalable framework for analyzing the political foundations of the green transition by linking fine-grained exposure indicators to the policy content of electoral outcomes through the Policy Favorability Index (PFI) and the Interest–Vote Incongruence (IVI) index. While IVI provides a continuous measure of misalignment between exposure and political support, the high-exposure–low-PFI quadrant classification offers an intuitive categorical counterpart; despite their different constructions, both yield highly consistent spatial patterns, indicating that the main results reflect structural geographic regularities rather than measurement artifacts. At the same time, several limitations should be acknowledged. The PFI, although constructed in a systematic and transparent way, rests on expert judgment informed by manifesto syntheses generated with the assistance of a large language model, so individual party scores may be open to debate even if the overall ranking is robust. Moreover, the neighborhood-level design captures average political alignment rather than individual voting behavior, precluding causal inference about how exposure shapes preferences. These constraints point to clear directions for future research, including individual-level surveys and cross-national comparisons to assess whether similar patterns of spatial political incongruence emerge in other institutional and political settings.

In conclusion, the results of this paper reveal a deeply stratified political geography of the green transition structured around education and urbanity. While exposure to high energy costs, poor housing quality, and climate-related risks is widespread across both cities and peripheral regions, political alignment with housing-level climate and redistribution policy is not. Highly educated and densely urban neighborhoods—whether in the Randstad or in regional cities—tend to support parties offering stronger protection and compensation, whereas less urban and lower–human-capital areas are far more likely to combine similar levels of exposure with weaker policy representation. This pattern reflects the interaction of material interest, symbolic identity, and spatial inequality in contemporary climate politics (Achen & Bartels, 2016; Downs, 1957; Lockwood, 2018; Mason, 2018; Rodríguez-Pose, 2018). A just and politically sustainable green transition will therefore have to confront this urban–rural and human-capital divide directly, because the everyday costs of decarbonizing housing and energy systems fall most heavily on places where political support for redistributive climate policy is systematically weakest.

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