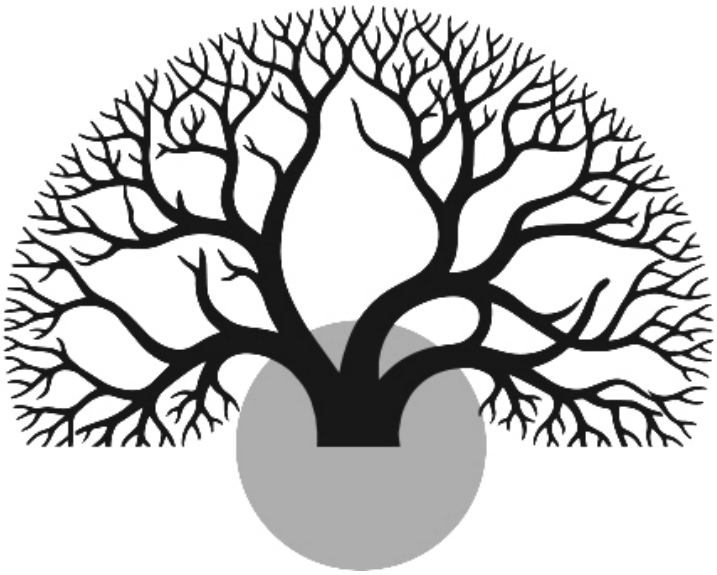
# *Democracy in the Bioeconomy? Local Opposition and the Limits of Democratic Decision-Making in Rural Infrastucture Conflicts in Germany*



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***Democracy in the Bioeconomy? Local Opposition and the Limits of Democratic Decision-Making in Rural Infrastucture Conflicts in Germany***

*Highlights:*

1. Five social worlds negotiated two manure-based facilities across four arenas of unequal access to decision-making
2. Access was shaped by boundary work through arena-shifting, temporal sequencing, and epistemic exclusion
3. A public referendum rejected both facilities but had no legal effect on either approval outcome
4. Each outcome was decided in a different arena, both above the municipal level
5. The facilities extended existing agro-industrial value chains rather than opening a path to diversification

*Abstract:* Rural regions face increasing pressure to accommodate bio-based infrastructure as part of national decarbonisation and bioeconomy strategies, generating conflicts that extend beyond technological concerns. This article examines how two manure-based facilities, a large biogas plant and a manure processing plant, were negotiated and contested over six years in the Oldenburger Münsterland, one of Europe's most intensive livestock regions. Drawing on Situational Analysis of press coverage, council proceedings, and company and civic initiative documents, the study reconstructs the social worlds, arenas, and discursive positions involved. Three mechanisms of boundary work relocated decision-making beyond local democratic reach. Arena-shifting moved decisions to intermunicipal and state-level institutions, temporal sequencing established path dependencies prior to public deliberation, and epistemic exclusion privileged expert over experiential knowledge. A referendum rejecting both facilities by 85 % of voters had no legal effect. The biogas plant was built, while the processing plant was abandoned after the intermunicipal association withdrew support. In both cases, the political effectiveness of local claims depended more on access to the deciding arena than on their substance. Such conflicts concern the governance of rural transformation rather than technology acceptance, and facilities extended rather than restructured existing agro-industrial value chains.

*Keywords*: Boundary work, Situational Analysis, multi-level governance, biogas, rural development.

***¿Democracia en la bioeconomía? Oposición local y los límites de la decisión democrática en conflictos sobre infraestructura rural en Alemania***

*Ideas clave:*

1. Cinco colectivos sociales negociaron dos plantas de purines en cuatro ámbitos de acceso desigual.
2. El acceso se configuró mediante desplazamiento de ámbitos, secuenciación temporal y exclusión epistémica.

3. La consulta ciudadana rechazó ambas plantas, pero sin efecto jurídico sobre las autorizaciones.
4. Cada desenlace se decidió en un ámbito distintos, siempre por encima del nivel municipal.
5. Las plantas prolongaron las cadenas agroindustriales existentes en lugar de abrir una vía diversificadora.

*Resumen:* Las regiones rurales enfrentan una presión creciente para acoger infraestructuras de base biológica en el marco de estrategias de descarbonización y bioeconomía, lo que genera conflictos no solo tecnológicos. Este artículo examina cómo dos plantas de purines, una de biogás y otra de transformación, fueron disputadas durante seis años en el Oldenburger Münsterland, una de las regiones ganaderas más intensivas de Europa. Mediante un Análisis Situacional de prensa, actas municipales y documentos empresariales y ciudadanos, el estudio reconstruye los mundos sociales, los ámbitos y las posiciones discursivas implicadas. Tres mecanismos de trabajo de frontera desplazaron la decisión fuera del alcance democrático local: el desplazamiento hacia ámbitos supramunicipales, la secuenciación temporal, que generó dependencias antes de la deliberación pública, y la exclusión epistémica, que privilegió el saber experto sobre el experiencial. La consulta ciudadana rechazó ambas plantas sin efecto jurídico. La de biogás se construyó, y la otra se abandonó tras retirarle su apoyo la asociación intermunicipal. La eficacia política de las demandas dependió más del acceso al ámbito de toma de decisiones que de su contenido. Estos conflictos atañen a la gobernanza de la transformación rural más que a la aceptación tecnológica, y las plantas prolongaron las cadenas agroindustriales existentes sin reestructurarlas.

*Palabras clave*: Trabajo de frontera, análisis situacional, gobernanza multinivel, biogás, desarrollo rural.

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## *1. Introduction and justification*

Rural areas across Europe are increasingly becoming sites for infrastructure projects designed to address pressing environmental challenges and declining fossil energy supplies, including renewable energy installations, waste processing facilities and nutrient management plants. These developments are frequently framed as opportunities for rural development, promising regional value creation, employment, and a share in the returns of transition, and as solutions to environmental problems, such as climate change, energy security, and agricultural nutrient surpluses. Yet they also transform rural landscapes, economies, and communities in ways that frequently generate local resistance and conflict (Batel, 2020; Naumann & Rudolph, 2020). As national and European sustainability strategies increasingly rely on rural land and resources, questions arise about how the costs and benefits of these transformations are distributed, and who has the power to shape the conditions for rural change (Bridge et al., 2013; Calvert et al., 2022).

In Germany, this is particularly visible in the two intersecting policy domains of energy transition (Energiewende) and the reorganisation of agricultural nutrient flows in response to EU environmental regulations. Under the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz), first enacted in 2000, the share of

renewables in German electricity production increased from 6 % in 2000 to over 55 % by 2024 (Umweltbundesamt, 2025).

At the same time, regions characterised by intensive livestock production face mounting pressure to address nutrient surpluses that contribute to groundwater pollution and soil degradation. The revised EU Nitrates Directive and the German Fertiliser Ordinance (ger. Düngeverordnung) have prompted technological responses, including biogas plants that convert liquid manure into energy and digestate, as well as manure processing facilities that separate and concentrate nutrients for export or transformation into marketable fertiliser products (Méité et al., 2024).

Across Europe, manure treatment has expanded primarily in response to regulatory pressure rather than local demand. In a survey of stakeholders in four livestock-intensive countries (Denmark, Italy, the Netherlands and Spain) government regulation was the factor most widely identified as stimulating adoption, while the barriers named were predominantly economic (Hou et al., 2018). National settings differed in which technologies were adopted, with bioenergy production playing a larger role in Denmark and Italy than in Spain and the Netherlands, pointing to the role of policy context. Comparing the Dutch, German and Danish trajectories, Laugs and van der Windt (2026) located the difference in the founding rationale. Policy in Germany and Denmark carried notions of self-reliance and local value creation, whereas Dutch biogas developed largely as a response to agricultural manure surpluses. A biodiesel plant in Castilla y León delivered little rural development once an initially cooperative model shifted towards external capital and imported feedstock (Gómez-Ramos et al., 2013). For France, Bourdin et al. (2020) showed across three Normandy projects that where a plant's location is imposed rather than chosen, and where developers lack close ties to the local community, conflicts tend to become intractable and opponents turn to open protest. Size is not in itself an obstacle where facilities are locally embedded and residents share in the benefit (Bourdin and Delcayre, 2024).

Social-scientific studies have often approached local opposition in terms of public acceptance (e.g., Wüstenhagen et al., 2007; Upham et al., 2015). While this body of research provides important insights, it tends to underplay the complex social processes through which conflicts emerge, stabilise, or transform at the local level. Critical scholarship has demonstrated that the NIMBY (Not In My Back Yard) explanation for local opposition is insufficient, with equity, fairness, and procedural

justice emerging as significant factors (Wolsink, 2007; Reusswig et al., 2016; Rand & Hoen, 2017).

More differentiated approaches have begun to examine the interplay of procedural and distributional justice concerns in local infrastructure conflicts (Jenkins et al., 2016; Kerker et al., 2024) and the diverse social positions citizens occupy, with varying capacities to influence planning processes (Cowell, 2010; Schwarz, 2020). Despite the growing body of research on local infrastructure conflicts, and calls for attention to the interplay of actors, discourses, and material conditions in energy transitions (Bridge et al., 2013; Calvert, 2016), few studies examined how these elements interact in specific rural localities, particularly when multiple interconnected facilities are contested simultaneously.

This article addresses that question by analysing conflicts surrounding two contested bio-based infrastructure projects in northwestern Lower Saxony, Germany. Both projects, a large-scale biogas plant and a manure processing plant, were designed around livestock manure as their main input material, and embedded within broader strategies of energy transition and bioeconomy development. The two projects were promoted by overlapping coalitions, were sited on the same industrial estate, and met the same public rejection, yet only one was built.

The article contributes to rural development and infrastructure research by showing how multi-level governance arrangements separated local participation from local influence, and by identifying a pattern in which bio-based infrastructure extended rather than restructured the agro-industrial model of the region.

The analysis is guided by two research questions:

RQ1: Which actor constellations and governance arenas shaped the contestation of bio-based infrastructure projects in a rural intensive livestock region?

RQ2: How did actors contest decision-making authority, legitimate knowledge, and democratic participation in these conflicts, and how were these conflicts shaped by where and when decisions were taken?

## 2. Theoretical and conceptual background

### 2.1. Boundary work in infrastructure governance

Infrastructure conflicts are simultaneously disputes over technology and struggles over the boundaries that determine where decisions are made, when participation occurs, and whose knowledge counts (Bridge et al., 2013; Calvert et al., 2022). We distinguish arena, time, and knowledge as three central dimensions along which boundaries are drawn.

The concept of boundary work was developed by Gieryn (1983) to examine how scientists demarcate their work from non-science, and has since been extended to contexts where actors draw, maintain, or contest boundaries to claim authority, protect autonomy, or exclude others from decision-making (Guston, 2001; Hoppe, 2010). In infrastructure conflicts, Jasanoff (1998) demonstrated how regulatory processes frame certain questions as technical matters requiring expert judgment, thereby restricting who counts as a legitimate participant. Wynne (1996) showed how official knowledge claims marginalise experiential knowledge held by affected communities.

Recent scholarship connects such demarcations to multi-level governance. Flinders and Buller (2006) use the term arena-shifting for the relocation of issues to institutional settings with different rules of access. Understood this way, depoliticisation operates through boundaries rather than through the suppression of debate. Schmidt (2013) notion of throughput legitimacy addresses this gap. A conflict can exhibit lawful outputs and genuine participation while the connection between the two is severed. This concept has been applied to infrastructure policy in multi-level settings, including onshore wind expansion in Germany (Fraune and Knodt, 2017). In their research on rural governance, Connelly et al. (2006) demonstrated that it becomes unclear what criteria should be used to assess the legitimacy of collaborative and deliberative arrangements when these supplant representative forms of government.

Boundaries of arena determine where a decision is taken and thus who has standing in the arena that takes it. Boundaries of time separate what can still be contested from what has already been settled, since early commitments foreclose later options (Pierson, 2004). Boundaries of knowledge determine which forms of evidence

are admitted. Each delimits the scope of legitimate contestation, and each can be drawn without the others being invoked.

### *2.2. Symbolic interactionism, social worlds, and arenas*

To analyse how these boundaries become meaningful and contested in situated interaction, this study draws on symbolic interactionism, a theoretical tradition concerned with how people create meaning through social interaction (Blumer, 1969). From this perspective, conflicts over infrastructure are not simply conflicts of interests, but struggles over the meaning of what a biogas plant or a manure processing facility represents for different groups.

The study draws on social worlds and arenas as sensitising concepts for analysing conflicts over bio-based rural infrastructure, developed by Strauss (1978). Social worlds are collective actors organised around shared activities, commitments, and resources and held together by shared discourses. Social arenas are sites where representatives of multiple social worlds come together around issues of shared concern. In arenas, social worlds negotiate, contest, and coordinate their positions. Arenas are characterised by ongoing struggles over resources, interpretations, and legitimate courses of action (Strauss, 1978; Clarke, 1991). For the analysis of infrastructure conflicts, this framework offers two advantages. First, it avoids predefined actor categories, such as 'state' and 'civil society', and instead allows actor constellations to emerge from empirical analysis. Second, the arena concept directs attention to how access to decision-making is structured, since different arenas operate according to different rules, and social worlds have unequal capacities to participate and influence outcomes.

### *2.3. Situational Analysis*

Clarke (2005) extended Strauss's work with Situational Analysis (SA), arguing that the analysis must not only include actors and their interactions, but the entire situation, including discourses, material elements, technologies, and that which remains unspoken. SA operates at the meso-level, where macro-level forces such as energy transition policies or EU regulations meet local practices and conflicts (Clarke & Star, 2008).

Three contributions of the SA literature bear directly on the present study. First, SA makes absences analytically tractable. Glück (2018) and Lempinen (2022) showed how the method surfaces marginalised positions and silences in dominant energy discourses, and Pohlmann and Colell (2020) demonstrated that citizens in German urban energy grid conflicts frequently appear only as implicated actors whose interests are invoked by others. Second, SA studies revealed how unequal discursive power operated in energy, land-use and infrastructure decisions without reducing the analysis to a niche-versus-regime binary (Vinge, 2018; Pohlmann, 2019; Le Rouge et al., 2022). Third, SA has proven capable of relating institutional affiliation to patterns of inclusion and exclusion in governance arenas (Whitley, 2024). While studies document that formal participation often fails to translate into influence, this article examines the mechanisms behind that gap.

## *3. Objectives, methodology and sources, areas or case studies*

### *3.1. Research objectives*

Building on the theoretical framework outlined above, the present study focuses on the social and discursive dynamics surrounding two infrastructure projects by reconstructing how different social worlds position themselves, interact, and contest the projects within locally specific arenas.

More specifically, the study pursues three research objectives: (i) to identify and characterise the social worlds involved in the planning and contestation of biogas and manure processing infrastructure; (ii) to analyse the arenas in which negotiations take place and the ways in which local decision-making, public discourse, and participation are structured; and (iii) to reconstruct the discursive positions in the negotiations.

### *3.2. Methodological approach and material*

The corpus comprises publicly available documents from March 2020 to October 2025, spanning the conflict from the projects becoming publicly known to the most

recent regulatory decision. The corpus was assembled through systematic searches of the online archives of the press, policy documents, the council information system of the municipality of Saterland, C-Port and developer homepages, and the social media appearances of the two citizens' initiatives, using the search terms *Kaskum*, biogas *plant*, *biomethane plant*, *Revis*, *Nordfuel*, *C-Port*, *Saterland* and combinations of these terms. Table 1 sets out the composition of the resulting corpus.

*Table 1.*
*Composition of the document corpus (2020-2025)*

| Document type | Source | N |
|---|---|---|
| Regional newspaper articles | Nordwest-Zeitung; OM Online (Münsterländische Tageszeitung / Oldenburgische Volkszeitung), Northeimer Neueste Nachrichten, Ruhr-Nachrichten, Wittlager Kreisblatt, Tageblatt, Westfälischer Anzeiger | 127 |
| National and sector-specific media | Top Agrar, Agrarzeitung, Erneuerbare Energien, Land & Forst, Agrar Heute, Energie & Management, Profi, Biogasjournal, DLG-Magazin, Binnenschifffahrt, Allgemeine Bauzeitung | 24 |
| Motions, minutes and protocols of council and committee sessions | Municipality of Saterland | 11 |
| Q&A documents responding to public questions | C-Port Zweckverband (answers by Revis and Kaskum) | 2 (approx. 100 pages) |
| Public statements, position papers, information material | Project developers, partner companies, industry associations, C-Port | 19 |
| Party documents | CDU, SPD and Green Party, Saterland, Friesoythe, Cloppenburg | 7 |
| Documents of a civic association | Mehr Demokratie e.V. Landesverband Bremen/Niedersachsen | 2 |
| Facebook pages of citizens' initiatives | Sauberer C-Port; BBSU | 2 web pages |

Source: own elaboration.

Documents were included if they referred to one or both projects. Items retrieved by the search terms that concerned C-Port without addressing the two projects were excluded. Each document was reviewed individually to ensure that the

newspaper articles are unique items rather than local editions or updates of the same report. Where the publishing houses covered the same event, they did so in separate pieces by their own correspondents. Only posts published by the initiatives themselves were analysed, while comments by private individuals were not included. Online sources were last retrieved between July 2025 and January 2026. The corpus was closed in October 2025, when the reissued discharge permit concluded the last open regulatory procedure. Quotations were translated by the authors. The German originals are given in the list of empirical material.

The corpus does not include the permitting files themselves (objections submitted during the formal participation period, minutes of the hearing, reasoning of the permit decisions) which are not routinely published and would require an application under freedom-of-information legislation. Our analysis therefore concerns the arenas in which the conflict was discursively enacted rather than the internal deliberation of administrative bodies.

The largest number of texts in the corpus is regional press coverage from two publishing houses (Nordwest-Zeitung, OM Online), which follow news values privileging visible conflict and identifiable protagonists. The corpus over-represents actors who sought publicity and under-represents those who acted through non-public channels. We therefore treat the absence of an actor from the corpus as evidence of absence from the public arena rather than as evidence of absence from the process. Sectoral media were included because their framing diverges from that of the regional press and thereby makes the discursive structure of the field visible.

All documents were coded manually by the first author. Maps were produced in three steps. Situational maps (Clarke, 2005) were created and iteratively refined, capturing the human and non-human actors, institutions, technologies, regulatory frameworks and discursive strategies essential to the situation. Social worlds/arenas maps were then constructed to identify collective actors and the arenas in which they operate. Finally, positional maps were used to reconstruct the range of discursive positions articulated in relation to key issues. All maps were reviewed and revised jointly by both authors.

Neither author has a personal or professional connection to the region or to the actors involved, and no contact was made with participants during the research. Prior familiarity with intensive livestock regions was a resource for reading the material and a risk of confirming expectations. Where the second author proposed a different attribution, the corpus was re-examined against both readings before the map was revised.

### *3.3. Case study area*

The study area is part of the Oldenburger Münsterland in northwestern Germany, belonging to the 'pig belt', an intensive livestock region, stretching across the Netherlands, Belgium, and Germany. The Oldenburger Münsterland comprises the districts of Vechta and Cloppenburg, which form one of Europe's most productive agribusiness clusters, characterised by an exceptionally high degree of vertical and horizontal integration between livestock producers, feedstuff industries, slaughterhouses, meat processors, and equipment manufacturers (Windhorst, 2004; Franz et al., 2018; Berg, 2024). The Oldenburger Münsterland was selected as an extreme case illustrating the conditions under which bio-based infrastructure is frequently deployed in European agriculture.

The concentration of livestock production has created severe environmental pressures (Tamásy, 2013), and the region has become a hotspot for groundwater nitrate pollution. With rising disposal costs, limited land for application, and stricter legislation, policymakers and agribusiness actors have promoted technological solutions such as biogas production and centralised manure processing as ways to manage surpluses while generating economic value (Franz et al., 2018; Gesing, 2023).

The study focuses on two contested manure-based infrastructure projects planned for the C-Port, an intermunicipal industrial park established in 2007 along the waterway 'Küstenkanal' on the border between the towns of Saterland and Friesoythe, governed by a special-purpose association ('Zweckverband') comprising Cloppenburg District and the two municipalities. It also allows for a contextual comparison, as the two projects operated within the same institutional setting but led to different outcomes.

The first project, the biogas plant of Revis/Nordfuel, represents one of Europe's largest manure-based biogas facilities. The facility processes one million tonnes of substrate annually, three-quarters solid manure and one-quarter liquid slurry. Products include biomethane, Bio-LNG, liquid $CO_2$, and ammonia.

Additionally, a second project, the manure processing facility 'Kaskum' inspired by Dutch technologies was planned to process one million tonnes of liquid manure annually, producing phosphate, nitrogen, potassium, and salts as exportable fertiliser products, with cleaned process water to be discharged via pipeline into the Sagter Ems river.

# 4. Results

### *4.1. Social worlds, arenas, and actor constellations (RQ1)*

The conflict unfolded over several years. Project planning proceeded largely outside public view until December 2019, when Revis filed its application for a permit to discharge treated process water into the Sagter Ems, marking the formal beginning of the approval process (Hemken-Wulf, 2025).

Public awareness of the projects emerged in early 2020, prompting the rapid formation of the citizens' initiative 'Sauberer C-Port' in March 2020 (Bickschlag, 2020a). In the same month, the initiative submitted 77 written questions regarding environmental and health concerns. Revis/Nordfuel and Kaskum responded with detailed answers in April 2020 (c-Port Zweckverband IIK, 2020a). Later that year, 'Sauberer C-Port' initiated a citizens' petition in response to persistent public opposition, which resulted in a referendum in September 2021. In June 2021, it constituted itself as a formal association, the 'Bürgerbewegung Saterland und Umgebung' (BBSU) in order to gain standing for legal proceedings (Hemken-Wulf, 2021a).

Between May and June 2020, the Lower Saxony state ministers for Environment and for Economic Affairs met with the investors of both Revis and Kaskum, signalling high-level political support for the projects (Binnenschifffahrt, 2020; Grunert-Elsen, 2020). In June 2020, the C-Port association sold the land to the investors. On the same day, the Saterland municipal council rejected, by its conservative Christian Democrats' (CDU) majority, a motion by Social Democrats (SPD) and Green Party councillors that would have instructed the municipality's representatives in the C-Port association to vote against the land sales. By early 2021, the permit to discharge had been granted and the pipeline route alignment was fixed (Stix, 2021). Despite the citizens' referendum in September 2021 in which 85 percent of voters rejected both projects on a turnout of nearly 40 percent , the result had no binding legal effect on the approval process (Fertig, 2021; Hemken-Wulf, 2021b).

From this point the two projects diverged. The account below follows Revis, whose plant was realised. A formal public participation period, required under the Federal Immission Control Act, followed in January 2022, during which project

documents were made available to the public for inspection (Fertig, 2022a), yet by this point land had been sold, permits partially granted, and financial commitments made.

Construction of the biogas plant started in March 2022 at Revis' own risk, before final approval had been granted (Stix, 2022). The final permit was issued by the state environmental permitting authority in Oldenburg (Gewerbeaufsichtsamt; GAA) in November 2022 (Hemken-Wulf, 2022). Revis commenced production in July 2024, and in October 2025 the district of Cloppenburg re-issued the permit to discharge with stricter monitoring conditions (Hemken-Wulf, 2024a, 2025).

Kaskum had already received a permit to discharge treated process water into the Sagter Ems before the projects became publicly known. In January 2021, its managing director and shareholder Gerd Stuke publicly declared that the outcome of the citizens' referendum would have "no relevance" for his company (Fertig, 2021). In November 2021, the company's management changed and Gerd Stuke was replaced by executives from the Goldschmaus Group, a major pork producer based in the neighbouring municipality of Bösel (Fertig, 2022b). Following a change in management and a reorientation of the business concept, the intermunicipal association withdrew its support, and in July 2022, Kaskum formally abandoned the C-Port location (Bickschlag, 2022).

Company records reveal the ownership structure of the proposed facilities. The biogas plant was developed by revis bioenergy GmbH (Münster), with investors including SD-Invest GmbH, a holding company whose managing director is identical with the Revis managing director, and two entrepreneurial families[a]. Of these, one investor holding a share of 50 % is the 'PHW Group', Germany's largest poultry producer, headquartered in Visbek in the neighbouring district of Vechta. PHW operates a vertically integrated production system encompassing feed manufacturing, hatcheries, contract farming, slaughterhouses, and processing plants throughout the region.

Kaskum's shareholder structure included regional agricultural organisations alongside private investors, namely the district farmers' associations 'Landvolk Cloppenburg' and 'Landvolk Vechta', the agricultural trading and services companies 'GS agri' and 'Fleming + Wendeln', and private entrepreneurs[b].

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a• Company records were retrieved from the commercial register via North Data, which aggregates official German Handelsregister publications; https://www.northdata.com/Biomethan%20C-Port%20GmbH, Münster/HRB 17482, shareholder list filed 23 March 2022.

b• https://www.northdata.com/Kaskum%20GmbH%20&t%20Co%C2%B7%20KG,%20Garrel/Amtsgericht%20Oldenburg%20HRA%20203986; Dahlmann-Aulike. (2022b).

### 4.1.1. Social worlds

Five social worlds structured the conflict, each characterised by distinct commitments, practices, and discursive orientations (Table 2).

*Table 2.*
*Social worlds in the C-Port conflict*

| Social world | Core actors | Shared commitments | Central discourses |
|---|---|---|---|
| Bioeconomy-industrial world | Investors in Revis/Nordfuel and Kaskum, Landvolk[1], DZ Bank[2], development agencies, sectoral associations, sectoral media | Technological solutions, value creation, market development, regional competitiveness | Innovation, climate efficiency, circular economy, sustainability |
| Pro-development political world | Municipal politics Friesoythe, Christian democrats (CDU) majority Saterland, district administrator, state ministers (Environment, Economic Affairs) | Economic development, securing employment, trust in representative institutions | Jobs, tax revenue, regional competitiveness, legal procedures as legitimate |
| Participatory-critical political world | Social democrats (SPD) and Green Party Saterland, Saterland's Mayor Otto, CDU dissenters | Citizen representation, transparency, municipal self-determination | Democratic legitimacy, early participation, taking citizen concerns seriously |
| Environmental-civic world | Citizens' initiatives (Sauberer C-Port, BBSU[3]), | Precautionary principle, direct democracy, | Risk, health, environmental quality, critique |
| | environmental lawyer, environmental organisations (LBU Niedersachsen[4], BUND[5], NABU[6]), fishing club youth group, Green Party | system transformation | of factory farming |
| Regulatory-administrative world | GAA Oldenburg[7], county administration, OOWV[8], expert consultants | Legal compliance, procedural correctness, technical expertise | Threshold values, permits, expert assessments, administrative rationality |

1. Regional farmers' associations; 2. central institution for Germany's cooperative banks; 3. Bürgerbewegung Saterland und Umgebung e.V.; 4. ger. Landesverband Bürgerinitiativen Umweltschutz Niedersachsen e.V.: Lower Saxony Federation of Environmental Citizens' Initiatives; 5. ger. Bund für Umwelt und Naturschutz Deutschland: Friends of the Earth Germany; 6. Nature And Biodiversity Conservation Union; 7. ger. Gewerbeaufsichtsamt: state environmental permitting authority in Oldenburg; 8. ger. Oldenburgisch-Ostfriesischer Wasserverband: Oldenburg-East Frisian Water Board.

Source: own elaboration.

The *bioeconomy-industrial* world (Table 2) articulated climate mitigation, nutrient management and regional development as mutually reinforcing, framing investment as a contribution to climate-neutral transport that would also reduce the region's nutrient surplus. A circular economy logic underpinned the technical case, with residual streams recovered as fuel, Innovation served as the summary claim, the facilities being described as "a statement for innovation in the northwest[1] on account of their green products"[c].

The *pro-development political world* (Table 2) shared that positive assessment but emphasised job creation, tax revenue, and regional competitiveness, seeing "great opportunities and a strong capacity for innovation"[2] in the projects. Anchored across party lines in Friesoythe and the CDU majority in Saterland, it extended beyond the district: the State Minister for Economic Affairs, Bernd Althusmann (CDU). Althusmann held them to offer "new solutions to challenges in agriculture and commercially viable options for new climate-friendly fuels supporting our measures with a view to climate change"[3], assuming a pioneering national role in the energy transition. Within this world, environmental risk was treated as a matter for the regulatory apparatus rather than for public deliberation.

The *participatory-critical political world* (Table 2) emerged primarily within Saterland's municipal politics. While institutionally embedded in representative structures, it aligned discursively with citizen concerns, emphasising transparency and early participation. They insisted that binding steps must follow rather than precede public deliberation and that "establishing faits accomplis without a public hearing is not acceptable"[4]. This claim was not merely procedural but concerned who was entitled to decide. Siting decisions must not rest with the district administrator and the two mayors alone, this world held, but be carried by the district and municipal councils and above all by the population of the surrounding municipalities (Bündnis 90/Die Grünen Cloppenburg, 2020). The same asymmetry was also evident in territorial terms, namely in the observation that "it cannot be the responsibility of two municipalities in the northern part of the Cloppenburg district to resolve, at short notice, a problem that has long been known to affect an entire region"[5].

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c• Empirical sources are listed separately from the academic literature. Documents from the corpus are cited in the text by originator and year and given in full in the list of empirical material following the references.

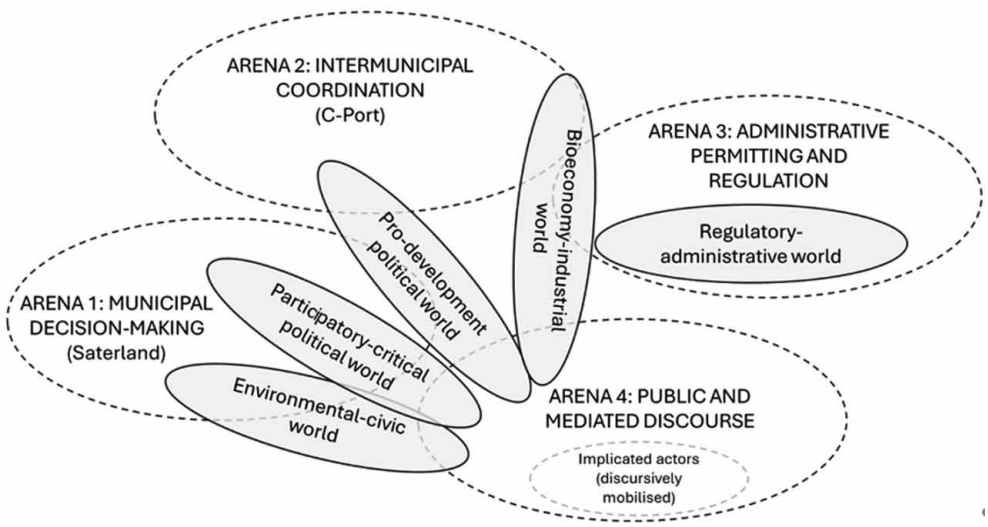
The *environmental-civic world* (Table 2) constructed the projects as risk-laden interventions threatening environmental quality, public health, and democratic self-determination, and perceived them as part of an existing burden rather than as forward-looking infrastructure: "two million tonnes of manure and slurry stink. We already have Kampe [note: meat meal factory in the municipality Kampe] and the landfill, and that is enough"[6]. It mobilised through the citizens' initiatives and environmental organisations listed in Table 2, and through the fishing club youth group, which demonstrated at the council session of June 2020 (Stix, 2020a). Beyond the immissions, the facilities were interpreted as artefacts of the production system that sustained them, as "monuments to factory farming"[7], which would be unthinkable and unprofitable without the excrement produced in abundance in the region. Processing was therefore seen as perpetuating the problem it claimed to solve, since relieving operators of disposal costs removes the incentive to reduce stocking densities, such plants being "one-way streets in the material cycle"[8].

The *regulatory-administrative world* (Table 2) occupied a structurally distinct position. Operating according to legal-technical rationality, this world followed its own logic of threshold values, procedural compliance, and expert authority, and its authorisations recorded the outcome of that assessment as a binding decision. Discharge into a surface water body requires a permit under the Federal Water Act, and "no grounds for refusal were established"[9]. Within this world the Revis/Nordfuel plant was classified in accordance with the reference document on best available techniques for the waste treatment industry (Landkreis Cloppenburg, 2025).

#### *4.1.2. Social arenas*

The conflict unfolded across four distinct arenas, each structured by different logics, rules of access, and power asymmetries (Figure 1).

*Figure 1.*
*Social Worlds/Arenas map of the C-Port bio-based infrastructure conflict*




Source: own illustration.

The *Saterland municipal decision-making arena* (Arena 1) operated through council votes, motions, and direct democratic procedures. Here the participatory-critical and environmental-civic worlds acted through the citizens' initiative, which collected more than 2,000 signatures (nearly double the required threshold) triggering the citizens' referendum in which both projects were rejected in September 2021 (Stix, 2020b). However, this arena's reach was limited to municipal competences. The CDU majority consistently outvoted opposition motions, including attempts to bind Saterland's representatives in the C-Port association to oppose the projects (Stix, 2020a).

Within the *intermunicipal and economic coordination arena* (Arena 2), the special-purpose association governing C-Port constituted a technocratic arena governed by statutes, weighted voting rights, and contractual arrangements. Saterland held a structural minority position alongside Friesoythe and Cloppenburg county. In June 2020, the executive committee of the C-Port port authority approved the sale of land to investors for the construction of two manure and slurry processing facilities. Saterland's mayor stayed away in protest at the scheduling of the meeting

before his own council had deliberated, and was censured by that council for failing to represent the municipality (Bickschlag, 2020b). The C-Port industrial park lies entirely on Friesoythe territory, and both projects were planned in ways that avoided Saterland municipal land. Kaskum's site required no municipal parcels, and the Revis pipeline trajectory was routed along federal highways, exclusively on private, county, state, or federal land (Fertig, 2021; Stix, 2021).

Permits and licences were issued not by municipal authorities but by the county for Kaskum and the state-level trade supervisory authority for Revis. The *administrative permitting and regulation arena* (Arena 3) was dominated by the regulatory-administrative world and incorporated the bioeconomy-industrial world, operating according to legal-technical rationality. This arena was not entirely closed. The developer undertook an environmental impact assessment that was not legally required (Dahlmann-Aulike, 2022a; Fertig, 2022a), and an objection by the environmental organisation LBU suspended the discharge permit and tightened its conditions when it was reissued in October 2025 (Hemken-Wulf, 2024b, 2025; Landkreis Cloppenburg, 2025).

Within the *public and mediated discourse arena* (Arena 4), competing interpretations were produced and circulated through local newspapers, sectoral media, press releases, and digital platforms. Sectoral media such as Biogasjournal and the Deutsche Landwirtschafts-Gesellschaft (DLG)-Magazin framed the projects almost exclusively as technological successes (Aue, 2024).

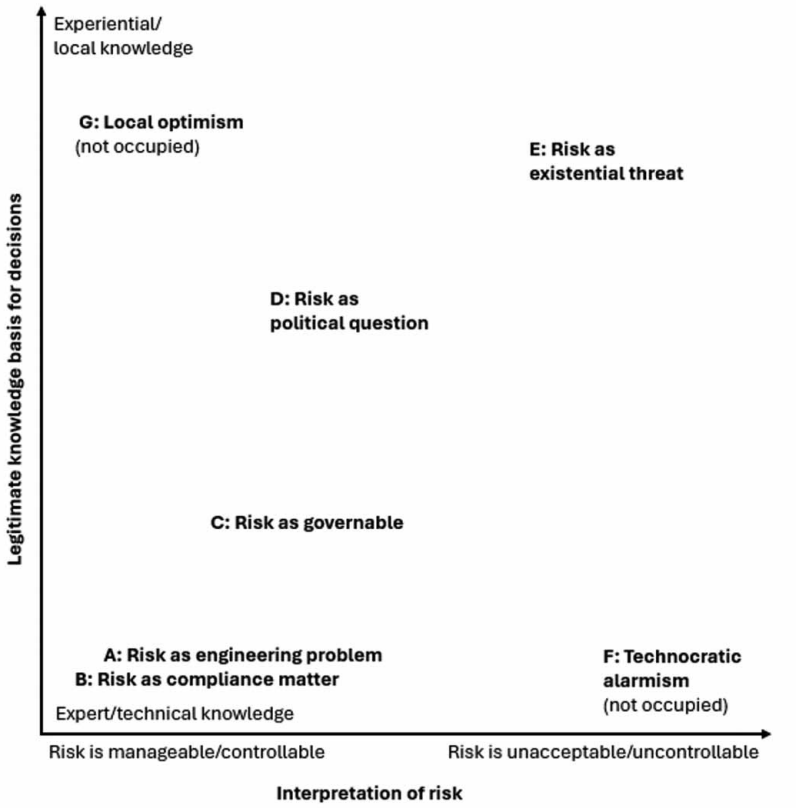
The analysis also identified several implicated actors (groups discursively constructed by others but not speaking for themselves in any arena). The contra-project coalition invoked children, future generations, and aquatic species in the Sagter Ems to frame the projects as threats to local environments and intergenerational equity. The pro-project coalition mobilised potential employees and regional farmers as beneficiaries of reduced disposal costs. Although the regional farmers' associations and agrifood investors participated actively, individual farmers rarely appeared as speakers in the public arena, their economic necessity being asserted on their behalf.

#### *4.2. Contested positions and meanings (RQ2)*

Two positional maps reconstructed the space of articulated viewpoints in the C-Port conflict, each organised along two axes representing, respectively, competing

understandings of risk and knowledge, and competing understandings of democratic legitimacy. Examples of these positions are drawn from two question-and-answer documents published by the C-Port association in 2020, in which the association and the two developers responded to questions from residents and from the citizens' initiatives (c-Port Zweckverband IIK, 2020a; c-Port Zweckverband IIK, 2020b).

*Figure 2.*
*Positional map of risk perception and knowledge legitimacy in the C-Port infrastructure conflict*




Positions are shown along two axes: interpretation of risk (manageable/controllable to unacceptable /uncontrollable) and legitimate knowledge basis for decisions (expert/technical knowledge to experiential/local knowledge).
Source: own illustration.

The positional map of risk and knowledge (Figure 2) reconstructs how the risks associated with the proposed facilities were assessed and which forms of knowledge were regarded as legitimate for decision-making. The horizontal axis ranges from risk perceived as manageable to risk perceived as unacceptable; the vertical axis ranges from exclusive reliance on expert and technical knowledge to recognition of experiential and local knowledge as equally legitimate.

Position A understands risk as an engineering problem that can be managed through technical solutions, and risk is excluded rather than weighed. The developers assured residents that exceeding existing limit values was "not possible"[10], that no streams capable of harming the environment would be released, and that, "should the parameters exceed the prescribed values, the discharge will be stopped automatically"[11]. Risk here becomes an element of the control loop, and evidence takes the form of reference installations. Asked by the citizens' initiative whether the processes were already in use, Revis pointed to its plant in Dülmen (North Rhine-Westfalia) where "the same processes for biomethane production are employed as are planned for the C-Port site"[12].

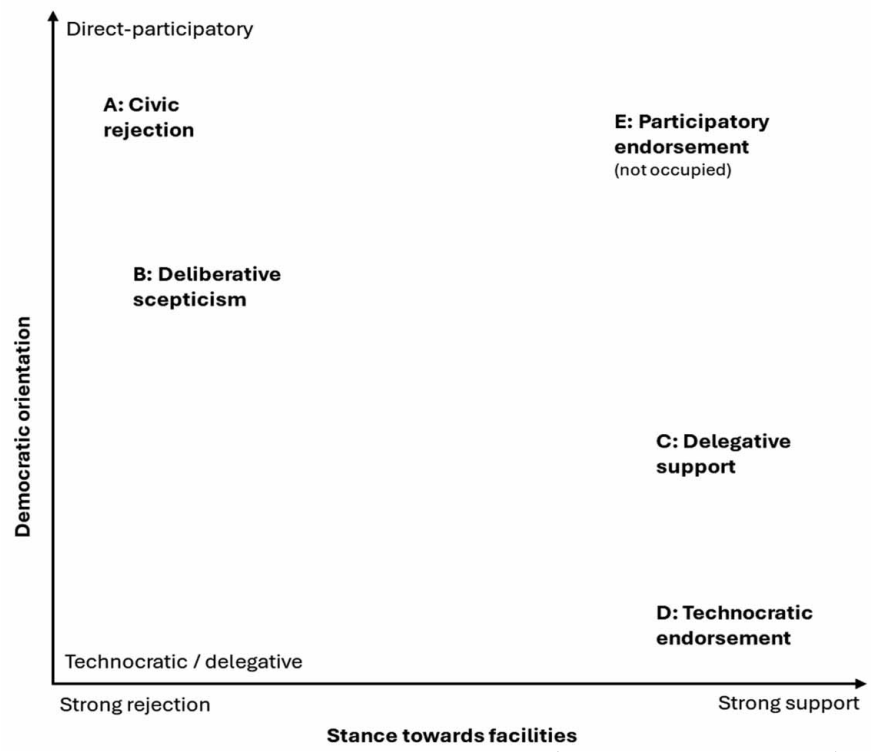
Position B locates risk in compliance with statutory thresholds. Where Position A promised that harm will not occur, this position specified that exceeding the environmental quality standards obliges the operator to halt the discharge immediately. Both positions cluster in the lower left quadrant, and the traffic between them is visible in how questions were handled. Asked about flooding, tidal backwater, bank erosion and who commissions the water testing, the Kaskum representative replied seven times that the question belonged to the permitting authority in Cloppenburg[13].

Position C treats risk as governable and acknowledges citizen concerns while deferring to technical assessment. Asked whether persistent odour nuisance could lead to closure, the association answered that the authority would set "a reasonable period for remedying the defects"[14], and could order the plant shut down if breaches recurred. Concern was taken seriously, yet its resolution is sought in the permit file rather than in public deliberation.

Position D conceives risk as a political question requiring both forms of knowledge. Its claim was not that the measurements were wrong but that the frame was too narrow. Residents argued that the systemic connections and interactions of all potential hazards should be considered and assessed together, and with a view to the future, setting an integrated appraisal against a parameter-by-parameter one (c-Port Zweckverband IIK, 2020b).

Position E, in the top-right quadrant, treats risk as an existential threat and grounds its claim in what residents observed rather than in what can be measured, and asserts lay knowledge openly: "I am not an expert, but if two companies discharge on the scale applied for, it will not work"[15] Local observation was held as evidence, as when a resident noted that "bank collapses recur after heavy rainfall" and are repaired by those living along the river[16]. Irreversibility takes precedence over verifiability. Positions F and G remained unoccupied, reflecting the alignment of technical expertise with risk optimism and of experiential knowledge with risk concern.

*Figure 3.*
*Positional map of democratic legitimacy framings in the C-Port infrastructure conflict*




Positions are shown along two axes: stance towards the facilities (strong rejection to strong support) and democratic orientation (technocratic/delegative to direct-participatory).
Source: own illustration.

The positional map of democratic legitimacy (Figure 3) shows that conflicts over the C-Port facilities were simultaneously conflicts over how infrastructure decisions should be democratically governed.

Position A rests on a direct-participatory understanding of democracy and calls for stronger local decision-making. The citizens' initiative asked why information had not been made available to political decision-makers although discharge permits already existed[17], and, more clearly, "why is this not being handled transparently for all citizens?"[18]. The claim extended to material terms, the initiative asking whether the municipalities would receive profit entitlements, company shares or rights of consultation[19], and to procedure, residents requesting information "before the political resolutions on the projects"[20].

Position B situates participatory claims within municipal representative democracy, and is visible where an elected representative carries citizens' concerns into the exchange rather than around it. A Saterland councillor submitted a numbered list of follow-up questions on catchment area, harbour use, storm-water protection, pipeline routing and emergency planning (c-Port Zweckverband IIK, 2020b). The same orientation shaped the SPD/Green motion in Saterland council, which sought to instruct the municipality's delegates to the association to block land transfers until the council had deliberated publicly (Gruppe SPD/Grüne, 2020).

Position C rests on a representative-delegative model in which mandate holders are the legitimate decision-makers. Answering the charge that decision-makers had been left uninformed, the association replied that the political mandate holders representing the municipalities and the district in the C-Port's bodies "have been continuously informed about the state of the talks and the investors' plans"[21]. Legitimacy thus runs through delegation into the association's committees, and "the committee resolves on the allocation of sites and thereby on the type of business settlements"[22]. Talks with "investors always proceed confidentially at first so that they have the possibility to examine a site economically and legally", and "when the signal is then at green", the people of the region were informed as well[23].

Positions C and D both combine project support with rejection of direct-participatory claims, yet C grounds legitimacy in delegated mandate while position D grounds it in technical expertise. Decisions or permits by authorities "are based on applicable law"[24]. Where the initiative had raised concerns about environmental pollution, the authorities acted independently within the law, and the association had

no influence whatsoever. Questions about livestock numbers or tourism were placed outside the answerable altogether, the first as "purely speculative"[25], the second as something it was "not our task to speculate about"[26]. Position E, combining project support with participatory engagement, remained unoccupied.

The positional map further reveals a scalar dimension that cuts across democratic orientations. Citizens' initiatives and environmental groups demanded a local veto right over industrial projects affecting municipal territory. The C-Port association, county administration, and the district administrator regarded decisions as matters of intermunicipal coordination requiring regional balancing of interests. Investors and state ministers positioned industrial infrastructure as part of broader regional economic strategy (Binnenschifffahrt, 2020), effectively locating decision-making authority beyond municipal jurisdiction.

## 5. Discussion

### *5.1. Infrastructure conflicts as governance conflicts*

Our findings show that the conflict is not simply characterised by opposing interests, but by the interplay between competing interpretations of risk, unequal standing of knowledge claims, and contested understandings of democratic legitimacy, which together shape the governance of rural development trajectories. A central finding concerns how legitimacy was claimed. The supporting coalition articulated no position combining support for the projects with a commitment to deliberation. This resonates with Connelly et al.'s (2006) finding that the principles of representative democracy continue to be the strongest source of legitimacy, even in seemingly deliberative arenas of rural governance. In the C-Port conflict, deliberative legitimation was absent from the supporting coalition altogether.

Schwarz (2020) has demonstrated that formally empowered citizens can remain effectively powerless when participatory arenas are decoupled from binding decision-making. Our case specifies how the decoupling is produced, not because participation was absent but because decisions were ordered in time, allocated across territorial scales, and confined to expert knowledge, rendering participation ineffective.

Based on the concept of boundary work, the findings reveal three mechanisms through which access to decision-making was bounded in this case. Several of the effects analysed here follow from the routine operation of an institutional architecture. First, arena-shifting relocated decisions from municipal arenas to institutional contexts in which citizen participation was marginalised. The C-Port association's weighted voting rules ensured Saterland's minority position, while state-level environmental permitting under the Federal Immission Control Act followed legal-technical rationality. Neither arena was wholly sealed, but when permitting was framed as a technical rather than a political matter, the authority to assess it was restricted to those with technical expertise, and the concerns of local residents appeared as questions for experts rather than as issues for public debate (Jasanoff, 1998).

Second, temporal sequencing established path dependencies before opposition could mobilise. Land sales, permit applications, and financial commitments preceded public debate. The sequencing extended to the suppression of information-gathering, when in June 2020, the council majority rejected a motion for a non-binding consultation on the projects, with the effect that no formal assessment of citizen opinion was conducted before the decisive contractual commitments were made. When the referendum subsequently produced an overwhelming rejection, foundational decisions had already been taken.

Third, epistemic boundary work privileged expert assessment over experiential knowledge. Residents' observations played only a limited role in formal decision-making, despite being central to public contestation (Wynne, 1996; Ottinger, 2013). Concerns raised publicly were referred elsewhere or dismissed as speculative, and the permit answered in limit values rather than the systemic appraisal residents had sought.

This exclusion was reinforced by marked territorial asymmetries. Economic benefits, such as industrial investment, employment opportunities, and tax revenues accrued to Friesoythe, while environmental burdens concentrated in Saterland. Cowell et al. (2011) have identified such territorial asymmetries as characteristic of infrastructure conflicts where projects serve supra-local objectives while their impacts are experienced locally. In our case the asymmetry was reinforced by land ownership, since neither project required Saterland parcels and the municipality was therefore left without the only instrument through which it might have exercised leverage. The referendum was thus legally binding within Saterland's own sphere of competence

and at the same time without purchase on either project, and the CDU majority's rejection of the motions in council opened a gap between the direct and the representative outcome inside the same arena. These patterns challenge NIMBY interpretations of infrastructure opposition as the conflict was not driven by parochial self-interest but by legitimate concerns about procedural exclusion (Wolsink, 2007; Reusswig et al., 2016).

Coalitions mobilised absent voices for their own purposes rather than allowing them to speak. Where Pohlmann and Colell (2020) find citizens invoked without speaking, our case identifies the region's farmers as absent from public discourse yet central to it, since the projects' legitimacy rested on their economic necessity.

### *5.2. The divergence between the two projects*

The two projects passed through the same institutional route and met the same public rejection, yet only one was built. This divergence is consistent with the account of boundary work, and it also constrains how far that account can be pressed.

Both projects were decided in arenas closed to residents (Revis at the level of administrative permitting, Kaskum in the intermunicipal association). The Kaskum case revealed that effective power to halt a project did exist, yet that it lay in an arena from which residents were excluded. The association's chair explained the withdrawal of support in distributive terms. The manure would be processed locally while the value creation accrued at the site of the new partner, a mineral-oil company in Cologne, and that is not something we will go along with" (Bickschlag, 2023). This was, in substance, the objection residents had raised all along (burdens local, benefits elsewhere) though framed differently. The association argued in terms of value extraction, the initiatives in terms set out above. The same territorial logic thus remained inconsequential when voiced by citizens yet became decisive when raised within the deciding arena.

The sequence in which commitments were made distributed the power to stop the two projects unevenly. By the time formal participation began in January 2022, Revis had secured the land through the intermunicipal association, and the discharge permit and the pipeline route through the county water authority. Kaskum held only the water discharge permit, had filed no building application, and had reached no comparable point. Therefore, it remained open to a veto.

### *5.3. Bio-based infrastructures and the restructuring of intensive livestock regions*

Energy and agricultural infrastructure projects reshape landscapes, land use and local social relations (van der Horst and Evans, 2010; Scheidel and Sorman, 2012). In a region as concentrated as the Oldenburger Münsterland, bio-based infrastructures can be read as technological fixes to structural problems of intensive production (Levidow, 2015; Friedrich et al., 2021). The ownership structures of both facilities, documented in commercial register filings, reveal that they were not neutral technological solutions to a shared regional problem, but investments that extended or became integrated into existing agro-industrial value chains, rather than opening a visible path towards productive diversification.

The framing of the projects as serving regional farmers obscured these constellations (Diekmann-Lenartz, 2020). Rather than reducing livestock density or restructuring agricultural production systems, they enable the continuation of existing production models by redistributing externalities through processing and relocation (cf. Baasch, 2021). The same dynamic has been documented by Termeer et al. (2019) at the national level. They show how a closed policy community of the agricultural ministry, farmers' organisations and sector specialists sustained the intensive livestock model in the Netherlands for over a century. The C-Port coalition assembled a similar constellation at the scale of a single siting decision, but supported only the plant whose value creation remained in the region.

From a rural development perspective, the C-Port conflict was therefore also a conflict over competing development trajectories, namely whether the energy transition would serve to diversify the regional economy and reduce ecological pressures, or whether it would reinforce the existing model of intensive livestock farming. The arrangement analysed here foreclosed this question before it could become subject to meaningful local deliberation.

Uleri et al. (2025) argue that rural energy transitions reshape material and social dimensions of rurality beyond energy provision. In the C-Port case, it operated economically, by tightening the linkage between rural value creation and vertically integrated chains, and ecologically, by treating nutrient flows rather than reducing them at source.

Naumann & Rudolph (2020) argue that rural areas increasingly bear the material burden of sustainability transitions while having limited influence over their

design. The C-Port conflict instantiates this argument and locates the asymmetry in the scale of governance rather than in rurality as such, since decisions about the region's future were made largely elsewhere whereas their consequences will be felt locally. The marginalisation of the local public in our case did not arise from demographic decline or economic weakness, but from the region's position in the decision making process. While Huttunen (2011) found local farm-scale bioenergy weakly embedded vertically, unable to fit existing institutional frameworks, the C-Port facilities show a weak horizontal embedding in local networks and strong vertical embedding in the deciding institutions. The question therefore arises how the same architecture operates where bargaining power vis-à-vis investors is weaker (Golubchikov and O'Sullivan, 2020).

### *5.4. Implications*

Our findings have implications for the study of sustainability transitions and rural infrastructure development. The study demonstrates the importance of analysing infrastructure conflicts as multi-arena governance processes, and SA proved valuable for mapping actors, knowledge claims, and institutional arrangements within a single framework. For planning and policy, the pattern documented here points to three institutional conditions that warrant attention in comparative research and policy development, namely the concentration of decision-making authority above the municipal level, territorial asymmetries that separated those bearing environmental burdens from those capturing economic benefits, and a temporal organisation of planning that established irreversible commitments before public deliberation could take place. Spatial planning frameworks could be examined for their capacity to require territorial reciprocity in projects with significant localised environmental impacts, ensuring that burden-bearing communities participate in decisions and share in benefits. Frolova et al. (2015) identified scalar integration and benefit sharing among the variables that are open to institutional intervention. Their comparison of Southern European cases shows that the separation of benefits from burdens stems more from the mode of project development than from the technology itself. Environmental impact assessment procedures could likewise be evaluated with respect to the timing of mandatory participation requirements relative to contractual and land-use commitments.

These conditions are likely to be more pronounced in depopulated and peripheral rural regions, where local authorities compete to attract investments, administrative capacity is limited and the promise of employment carries greater political weight. The incentive to accept such decisions without contestation increases, whilst the ability to run a two-year campaign, collect signatures and engage in legal disputes is more limited (Zografos and Martínez-Alier, 2009; Golubchikov and O'Sullivan, 2020).

### *5.5. Limitations*

Several limitations qualify these findings. The study is based on a single case, and the conclusions presented here are analytically rather than statistically generalisable. The three institutional conditions identified above constitute theoretical propositions that can be examined in other settings where decision-making authority is concentrated above the municipal level. The internal contrast between the two projects supports the causal interpretation offered here within the limits set out in Section 5.2. C-Port was chosen because the contestation was visible and well documented. As a result, the more common situation, in which supra-local site decisions do not provoke organised opposition, remains outside the scope of the analysis.

The analysis draws exclusively on documentary and mediated sources. It does not capture deliberation within the intermunicipal association, negotiations between investors and authorities, or the reasoning outside the public record. Interviews would have permitted respondent validation. In their absence, alternative readings of individual motives cannot be ruled out. The reliance on public sources bears unevenly on the three mechanisms. Arena-shifting and temporal sequencing rest on the public record of decisions and their timing, which the corpus documents well. Epistemic boundary work is harder to establish from public sources alone, since what counted as admissible knowledge was negotiated largely within the permitting process. Access to the permitting files under freedom-of-information legislation would be the appropriate test.

Finally, the institutional architecture analysed here is specific to the German case (the allocation of permitting competences across municipality, county and state, the binding but competence-limited status of the municipal referenda in Lower

Saxony, and the legal form of the *Zweckverband*). Transfer to other national contexts requires attention to these particulars.

## 6. Conclusions

This article examined the conflict surrounding two bio-based infrastructure projects in the C-Port industrial area in northwestern Germany to explore the governance of rural sustainability transitions. Using Situational Analysis, the study reconstructed the social worlds, arenas and discursive positions through which the projects were negotiated and contested. Three main conclusions emerge.

First, conflicts over bio-based infrastructures are, at their core, governance conflicts. A central finding concerns how boundary work relocated the decisive choices to arenas in which opponents had no standing. The clearest evidence is that the objection which eventually stopped one of the two projects was the objection residents had raised without effect for two years; what changed was the arena, not the argument.

Second, democratic legitimacy, local autonomy, and legitimate knowledge constitute contested political concepts. Neither claim to a constituency was illegitimate in itself, and the difficulty lay in the absence of any arena competent to adjudicate between them.

Third, the question of what the Oldenburger Münsterland should look like, what economic model it should sustain, and what environmental conditions its residents should accept was answered in arenas from which residents were excluded. We understand this as consequential for the territory's development path.

## 7. Future orientations

This study opens several avenues for future research on rural infrastructure conflicts and bio-based governance. Future studies could examine whether the governance patterns identified here manifest similarly in other intensive agricultural

regions. Comparison with the Netherlands and Denmark, and with settings where regional authorities hold discretionary planning powers, would show which dynamics are context-specific. The mechanisms may intensify in depopulating regions where municipal bargaining power is weaker and the political costs of opposing investment higher.

Conflicts evolve over time. Future research should trace whether opposition demobilises as infrastructures become normalised, whether new conflicts arise around operational impacts, or whether initial contestation leaves lasting effects on local political culture and institutional practices.

The epistemic mechanism proposed here is the claim most in need of corroboration. Access to the permitting files through freedom-of-information procedures would allow it to be tested against the treatment of objections within the procedure itself, and frameworks of epistemic justice would sharpen the question of whose knowledge counts in technical-administrative arenas.

Regional farmers were implicated but largely absent. Interviews and ethnographic work could establish how agricultural producers position themselves towards these infrastructures, which the documentary corpus cannot show.

Finally, our findings raise the question of whether institutional design can reconcile local participation with supra-local infrastructure objectives.

## *8. Funding*

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## *Empirical material / quotations (source list)*

1• *„mit ihren grünen Produkten ein Akzent für Innovationen im Nordwesten".*

revis bioenergy GmbH. (2023, May 11). Biomethan-Werk im c-Port: Grüne Energie für die Klimawende [Press release]. https://www.revis-bioenergy.de/2023/05/biomethan-werk-im-c-port-gruene-energie-fuer-die-klimawende/

2• *„Ich sehe hier große Chancen und eine hohe Innovationskraft."*

Elsen, H. (2021, November 20). Pro und Contra für C-Port-Anlagen. Nordwest-Zeitung, ed. Der Münsterländer, p. 10.

3• *„Sie bieten neue Lösungen für Herausforderungen in der Landwirtschaft und wirtschaftlich sinnvolle Möglichkeiten für neue klimaschonende Kraftstoffe, die unsere Maßnahmen mit Blick auf den Klimawandel unterstützen."*

Binnenschifffahrt (2020, July 1) C-Port wird zur Innovationsplattform. https://binnenschifffahrt-online.de/2020/07/haefen-wasserstrassen/15667/

4• *„Das Schaffen von Fakten ohne eine öffentliche Anhörung ist nicht akzeptabel."*

Gruppe SPD/Grüne im Rat der Gemeinde Saterland. (2020, April 29). Antrag gem. § 56 NKomVG – Weisungsbeschluss: Keine vorschnelle Verwirklichung der Projekte der Unternehmen revis bioenergy und Kaskum im c-Port. Anlage zur Beschlussvorlage 733/2016-2021, Gemeinde Saterland, Ratssitzung vom 22.06.2020.

5• *„Es kann aber auch nicht die Aufgabe von zwei Gemeinden im Nordkreis des Landkreises Cloppenburg sein hier kurzfristig das lange bekannte Problem einer ganzen Region zu lösen."*

Gemeinde Saterland (2020, May 28). Beschlussvorlage 733/2016-2021: Entscheidung über die Erteilung eines Weisungsbeschlusses für die in die Gremien des Zweckverbandes IIK C-Port entsandten Mitglieder zur Ablehnung der Ansiedlung der Firma „Kaskum GmbH".

6• *„2 Millionen Tonnen Mist und Gülle stinken! Wir haben schon Kampe und die Deponie, es reicht!"*

Bickschlag, T., Ambacher, C., & Hußmann, W. (2021). Keine stinkenden Mist- und Gülle-Monster im C-Port [Official text and justification of the Saterland citizens' petition]. Citizens' Initiative Saterland.

7• *„Diese Anlagen sind Monumente der Massentierhaltung. Ohne die in unserer Region im Überfluss anfallenden Exkremente wären sie überhaupt nicht denkbar, geschweige denn rentabel."*

Bündnis 90/Die Grünen Cloppenburg (2020, May 21). So sehen wir das – Grüne zu Güllefabriken im C-Port.

8• *„Solche Anlagen sind Einbahnstraßen im Stoffkreislauf."*

Bündnis 90/Die Grünen Cloppenburg (2020, May 21). So sehen wir das – Grüne zu Güllefabriken im C-Port.

9• *„Versagungsgründe wurden nicht festgestellt."*

Landkreis Cloppenburg. (2021, January 21). Erlaubnis gem. §§ 8, 9 und 10 WHG zur Einleitung von Stoffen in die Sagter Ems; Übertragung der Abwasserbeseitigungspflicht gem. § 96 Abs. 8 NWG. Aktenzeichen 618/2019 EOW (0185/2020 ERL).

All quotations in the following are taken from two question-and-answer documents published by the C-Port association in 2020, in which the association and the two developers responded to questions from residents and the citizens' initiative.

c-Port Zweckverband IIK, 2020a. Antworten auf Fragenkatalog der BI „Sauberer c-Port". https://c-port-kuestenkanal.de/wp-content/uploads/2020/04/FINAL-Fragebogen_web.pdf (a)

c-Port Zweckverband IIK, 2020b. Anfragen zu den Ansiedlungsvorhaben revis bioenergy & kaskum. https://c-port-kuestenkanal.de/wp-content/uploads/2020/05/revis-kaskum-Fragen-Antworten.pdf (b)

10• *„Wir können Ihnen zusichern, dass eine Erhöhung der bereits bestehenden Grenzwerte bzw. deren Überschreitung nicht möglich ist." (b)*

11• *„Sollten die Parameter die vorgeschriebenen Werte überschreiten, wird die Einleitung automatisch gestoppt." (b)*

12• *„Hierbei werden dieselben Verfahren zur Biomethanherstellung eingesetzt, wie sie auch für den Standort c-Port geplant sind." (a)*

13• *„Auf diese Frage kann ich im Detail nicht antworten. Fragen Sie bitte bei der Genehmigungsbehörde, dem Landkreis Cloppenburg, an." (b)*

14• *"Werden Grenzwerte nachweislich und messbar überschritten, verfügt die Behörde in aller Regel ein Bußgeld und gibt eine angemessene Zeit zur Beseitigung der Mängel vor." (a)*

15• *„Ich bin kein Fachmann, aber wenn 2 Firmen in der Größenordnung, wie beantragt einleiten, dann funktioniert das nicht. Es ist eine Frage der Zeit, dass es Probleme geben wird." (b)*

16• *„Es kommt immer wieder zu Uferabbrüchen bei starken Regenfällen, die von uns Anwohnern ausgebessert werden." (b)*

17• *„Warum wurden den politischen Entscheidungsträgern bislang keine Informationen zur Verfügung gestellt, obwohl bereits Einleitgenehmigungen vorlagen?" (a)*

18• *„Warum wird hier nicht transparent für alle Bürger gehandelt?" (a)*

19• *„Bekommen die Kommunen Gewinnansprüche, Firmenanteile oder Mitspracherechte?" (a)*

20• *„Wir bitten Sie um die Beantwortung, verbunden mit einer zeitnahen Information der Öffentlichkeit noch vor den politischen Beschlussfassungen zu den Projekten." (b)*

21• *„Die politischen Mandatsträger, die in den Gremien des c-Ports die beteiligten Kommunen und den Kreis vertreten, sind kontinuierlich über den Stand der Gespräche und die Planungen der Investoren informiert worden." (a)*

22• *„Der Verbandsausschuss beschließt über die Vergabe der [sic] und somit über Art der Betriebsansiedlungen." (a)*

23• *„Allerdings bitten wir um Verständnis, dass Gespräche mit Investoren zunächst immer vertraulich verlaufen, damit diese die Möglichkeit haben, eine Ansiedlung wirtschaftlich und rechtlich prüfen zu können. Wenn dann das Signal auf ‚Grün' steht, werden – weit bevor Anträge auf Baugenehmigungen gestellt werden – auch die Menschen der Region informiert." (a)*

24• *„Für die Beantwortung dieser Frage sind die zuständigen Behörden zuständig. Entscheidungen oder Genehmigungen von Behörden basieren auf geltendem Recht." (a)*

25• *„Eine Beantwortung dieser Frage ist aus unserer Sicht rein spekulativ." (a)*

26• *„Uns ist bisher von derartigen Zusammenhängen und Überlegungen nichts bekannt. Insofern ist es nicht unsere Aufgabe, darüber zu spekulieren." (a)*

## *Authors' contribution*

| | Astrid Artner-Nehls | Sandra Uthes |
|---|---|---|
| Conceptualization | 80 % | 20 % |
| Data curation | 100 % | 0 % |
| Formal analysis | 100 % | 0 % |
| Funding acquisition | 0 % | 100 % |
| Investigation | 100 % | 0 % |
| Methodology | 100 % | 0 % |
| Project administration | 0 % | 100 % |
| Resources | 0 % | 0 % |
| Software | 0 % | 0 % |
| Supervision | 0 % | 100 % |
| Validation | 0 % | 100 % |
| Visualization | 100 % | 0 % |
| Writing – original draft | 100 % | 0 % |
| Writing – review & editing | 0 % | 100 % |

For more information, CRediT: https://casrai.org/credit/