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ENCOURAGING A DIGITAL AND GREEN TRANSITION THROUGH REVITALISED AND INCLUSIVE UNION-EMPLOYER NEGOTIATIONS

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Cloud territorialisation and social dialogue: the case of AWS in Aragon

Abstract

This case study examines the socio-economic and labour implications of hyperscale data centre deployment by Amazon Web Services (AWS) in Aragon, Spain. Analysing the period 2019-2025, it explores how the territorial anchoring of global digital infrastructure interacts with regional policy and industrial relations' institutions working at the local under nation-wide frameworks. The research identifies three converging socio-historical processes that shape the analytical dimensions of the case: the territorialisation of cloud computing, intense inter-territorial competition facilitated by the regional "Project of General Interest" (PIGA) instrument, and Aragon's distinctive trajectory of uninterrupted social dialogue. The report relies on desk research (scientific articles, press analysis, policy and company documentation, etc.), and semi-structured interviews with key stakeholders in the decision-making process on the ways in which AWS has been finally integrated in the socio-economic landscape of Aragón . It shows that public discourse overwhelmingly prioritised investment narratives, largely excluding labour concerns. Social dialogue occurred primarily through discreet institutional channels, leading to tangible outcomes like applying the regional metalworking agreement, which as will be described below, is one of the most desired frameworks in terms of labor benefits in Spanish legislation. However, there has been limited influence over strategic project decisions. The conclusions highlight a model of institutional adaptation, where local frameworks absorb global technological disruptions, albeit with constrained public scrutiny and participatory governance, raising questions about the equitable distribution of benefits and costs. The study derives lessons for future policymaking, emphasising the decisive role of pre-existing institutional resources, the importance of early inclusion of social partners in negotiation sequencing, and the advisability of systematic monitoring of employment commitments.

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1. Introduction

Over the last few decades, digital infrastructure, particularly data centres, has become the fundamental technological basis for global digital and economic transformations. However, this type of infrastructure has also become a valuable investment asset for which different territories compete globally, as well as an important element of disruption and public debate in terms of employment and industrial relations. This, in turn, is intertwined with the central importance of energy supply and the environmental impacts associated with these data centres.

In this case study, which focuses on the installation of Amazon Web Services data centres in the autonomous community of Aragon (Spain), these characteristics are clearly evident. Since the company's first announcement in 2019 until 2025, Aragon has become one of the most important locations in Europe for data centres, with announced investments of around 70 billion euros (Gobierno de Aragón, 2025). Other players in the sector, such as Microsoft, or external players, especially energy companies, are playing a significant role, which has led Aragón to call itself the “European Virginia”, aiming to become Europe's third largest data centre hub by 2029 (Fundación Basilio Paraíso, 2025). However, Amazon Web Services (AWS) maintains a privileged position as a case study due to its pioneering and structuring nature in the sector, including a model of employment relations that combines both disruptive features and a significant role for social dialogue.

Likewise, this case study examines how pre-existing social dialogue institutions shape the reception of an emerging technology sector characterised by global corporate actors, high capital intensity, and limited direct employment. Specifically, it explores the negotiation dynamics that emerged as regional actors engaged with AWS under conditions of inter-territorial competition, and how costs and benefits have been distributed across territorial scales. The analysis traces the interplay between public discourse—dominated by investment narratives—and actual labour outcomes, asking whether Aragonese institutional resources enabled meaningful influence over the terms of data centre deployment or primarily facilitated territorial adaptation to external demands. This occurs within a distinctive regulatory framework—the Project of General Interest (PIGA) instrument—that structures inter-territorial competition while limiting municipal autonomy.

The territorialisation of cloud computing

Understanding the Aragonese case requires situating it within the broader process of cloud computing territorialisation—the evolution of cloud service companies from delocalised global players to increasingly territorialised agents requiring physical anchoring.

Data centres emerged in the 1960s-70s as rooms attached to mainframe computers, becoming dedicated infrastructure with the 1990s Internet expansion. The real transformation came after 2010 (Constantinides et al., 2018; Winseck, 2017), when cloud computing, social media and virtualisation turned data centres into the backbone of global digital infrastructure. As Altenried (2022: 131) observes: “the cloud is not immaterial, nor does it replace hardware; rather, it represents its spatio-technological reconfiguration at the global scale.”

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This evolution presents a significant paradox: the “cloud”, a metaphor for the ethereal, increasingly requires material anchoring. The sector's energy consumption reached 415 TWh in 2024—equivalent to 1.5% of global electricity consumption—and is expected to double by 2030 (International Energy Agency, 2025). Traditional hubs in the FLAP-D region (Frankfurt, London, Amsterdam, Paris, Dublin) show signs of saturation, rising land prices and local opposition, driving exploration of alternative markets (Goldman Sachs, 2024).
Data centres are not only unfolding controversial forms of green transition, but also increasingly becoming targets of labour conflicts. The centralisation of infrastructure entails reconfiguration of data-related labour: job losses in corporate IT departments, alongside outsourcing and streamlining of data centre jobs into what Mosco (2015) describes as an “industrial mode of production, processing, distribution and storage.”
Despite these challenges, collaboration with public authorities and cheap electricity remain guiding principles for data centre development (Hart et al., 2025). Since 2015, the boom in renewable energy in Aragon and intensification of global data centre deployment have converged. The region responded to key location criteria: cheap land, energy prices and reliability, climate, and availability of labour (Altenried, 2022: 133). AWS's October 2019 announcement of its seventh European availability zone in Aragon marked the beginning of the process analysed here.

Methodology

This study is based on a case study design combining various information-gathering methods. First, systematic analysis of regional and national press (2019-2025) comprising 1,653 articles from Heraldo de Aragón, El Periódico de Aragón, Arainfo, El País, El Mundo and other outlets. This analysis identified dominant narratives, actors involved in public debate, and evolution of issues covered over time. Second, desk research on primary documentary sources: legal texts, documents from the Aragón Social Dialogue Committee, parliamentary debates and corporate documentation. Third, semi-structured interviews with key actors: trade union representatives, environmental organisations and municipal officials from affected localities [1]. Finally, specialised reports and official statistics contextualised employment and investment data.

Type of material	Use in analysis

1 One weakness in the case study—partially offset by alternative sources—was the inability to interview some key informants during the fieldwork period, particularly from AWS and successive Aragon governments. Among other reasons, the judicialisation of some data centres since October 2025 and confidentiality commitments have made it difficult to obtain the cooperation of some of these informants.

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General press (1653)	Quantitative analysis of frequency, evolution and selected topics (employment, labour relations, green and digital transition) using keywords. Selection of documents for analysis of frameworks and narratives (≈85). Creation of a timeline defined at the level of discourse and milestones.
Interviews (4): Representative members of trade unions (2), Members of social movements critical of data centres Members of local social and political organisations	In-depth analysis of topics and narratives, and understanding of positions and strategies. Comparison with public positions. Compilation of relevant information.
Primary technical and legal sources: Labour and territorial legislation, declarations as projects of general interest.	Contrast and triangulation
Complementary secondary sources: Transcripts of parliamentary sessions, technical forums and press conferences (6). Technical reports on data centres, digital employment and related topics (8)	Reconstruction of processes and fidelity to technical dimensions. Replacement of primary sources.

Structure of the report

The report proceeds as follows. Section 2 establishes the institutional context shaping data centre deployment, examining the PIGA regulatory framework that structures inter-territorial competition and the distinctive Aragonese social dialogue tradition that provides unions with institutional resources. Section 3 analyses negotiation processes and social dialogue dynamics, including public debate frameworks, actor coalitions, negotiation strategies, and the phases through which negotiations evolved. Section 4 examines local-level dynamics,

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exploring how pre-existing institutions shaped outcomes, tensions between regional and municipal interests, and distributive effects. Section 5 concludes with lessons learned and implications for future technological transitions.

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2. Institutional Context

The analytical framework for understanding data centre deployment in Aragon requires attention to two distinctive institutional configurations that shaped how actors engaged with AWS and subsequent investors. These are not merely background conditions but active structuring elements that defined the parameters of negotiation, the resources available to different actors, and ultimately the outcomes achieved.

The regulatory framework: DIGA and PIGA instruments

The general tendency of territories to compete for investment by offering strategic, administrative and tax incentives intensified in Spain after the 2008 crisis and found distinctive expression in Aragon through the Project of General Interest (PIGA) instrument (De-la-Cal-Nicolás & Pemán-Gavin, 2025). The diversification of sources of economic activity has been a central concern of the Aragonese political class at least since the constitution as an autonomous community in 1982 (Germán Zubero, 2012). With an economic structure linked to the primary sector and industry—especially since the arrival of the Opel/GM factory that same year—dependence on the automotive sector was perceived as a structural problem. Faced with this uncertainty, exacerbated by wage competition with new EU member states in 2005 and the 2008 crisis, public policies focused on introducing legal mechanisms to favour investment in sectors considered strategic.

In this context, in 2008 the regional executive created the Declaration of Regional General Interest (DIGA), whose most notable features would be intensified in 2015 through the PIGA. The PIGA has become a powerful resource in inter-territorial competition and comprises two elements with different functions and origins.

The DIGA (2008) was created as an economic stimulus tool during the 2008 crisis. This resource was framed as an economic policy measure with an significant local dimension. Regional law focused on promoting projects according to their “impact in terms of the creation of full-time equivalent direct jobs in Aragon on an annual basis, as well as investment in fixed assets” (Decree Law 1/2008). To achieve this, the law provided for preferential treatment including halving administrative deadlines and processing via environmental impact statements. The DIGA also provides for automatic declaration of projects as 'of public utility', granting access to compulsory expropriation and occupation of affected land.

Unlike the DIGA—which has many similar counterparts in other Spanish regions—the PIGA (first proposed in 2009 and in its current configuration in 2015) has been a distinctive feature of Aragon until very recently. The PIGA is not formally a legal concept of economic development, but rather an urban planning regulation [2]. Its importance lies in the redistribution of urban planning powers from the local to the regional level, so that PIGAs

2 In fact, the PIGA legislation is not a new legal provision, but rather an amendment to a pre-existing one, the Aragon Land Use Planning Act, whose content, including the concept of PIGA, was introduced by Law 3/2009, of 17 June, on Urban Planning in Aragon and modified by Legislative Decree 2/2015 of 17 November of the Government of Aragon.

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“will be linked to the planning instruments of the municipalities concerned and will take precedence over them.”

This shift of powers has several consequences critical to understanding the negotiation dynamics analysed in this study. Firstly, certain provisions already included in the DIGA are strengthened, such as compulsory purchase, eased environmental assessment, and occupation of land for auxiliary infrastructure. Secondly, the PIGA declaration grants investing companies the status of urban developer, which accelerates processes while conferring significant territorial power. In addition, the regional government creates teams of specialised civil servants who accompany and advise investing companies throughout the entire process. Finally, by assuming municipal urban planning powers, the regional administration also assumes the ability to maintain or eliminate local taxes normally applied to new construction.

The most relevant tax is the 'Tax on Construction, Installations and Works' (ICIO), applied at construction start and representing 1-4% of total project value. This exemption represents revenue losses of €5-50 million for host municipalities—typically towns with fewer than 10,000 inhabitants. Following the COVID-19 pandemic and the 2023 change of government, use of this instrument has accelerated: while six projects were approved between 2009 and 2022 (including one data centre), eight have been approved since 2023, four being new data centre projects.

This regulatory framework, subsequently adopted by regions such as Castilla-La Mancha and Extremadura, can be interpreted through Brenner's (2005) concept of “glocalised state competition regimes”—characterised by the decline of traditional welfare and the rise of regional governance systems aimed at attracting investment through special legal mechanisms. Crucially for this analysis, while the PIGA has little direct relevance in digital, environmental or labour terms, it conditions the entire strategy for implementing data centres and defines the rules of the game under which companies, government, and social actors operate.

Aragonese social dialogue as institutional resource

The second institutional dimension concerns Aragon's distinctive framework of social dialogue, which constitutes a key resource shaping how actors have engaged with data centre deployment. Aragon represents a unique case in Spain: it is the only autonomous community where social dialogue has been maintained uninterruptedly since 1989, across governments of different political persuasions (Pina, 2019). This continuity has produced a “four-party model”—CEOE and CEPYME (employers), CCOO and UGT (trade unions), together with the Government of Aragon—that has generated thirteen successive agreements and, crucially, a stable culture of institutional cooperation between social partners. This historical trajectory was formalised in 2018 through the Aragon Social Dialogue Act, only the second of its kind at the autonomous community level, consolidating practices developed over three decades.

This institutional environment has directly shaped the conditions under which sectoral collective bargaining operates. Provincial agreements in key sectors such as metal—later extended to regional level—have consistently been considered by trade unions to be more favourable than their national equivalents. This outcome reflects the broader cooperative

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framework within which negotiations take place: the culture of dialogue, established channels of communication, and expectation of ongoing relationships create conditions enabling different bargaining dynamics than those observed in contexts of weaker institutionalisation.

For the present case study, this dimension is analytically significant because it explains why Aragonese unions possessed resources—institutional access, established interlocution, negotiating experience—that enabled them to engage with a global actor like AWS and secure outcomes such as application of the metalworking agreement. Without this pre-existing framework, the reception of data centres would likely have followed patterns similar to those observed elsewhere in the Spanish technology sector, where the national agreement for consulting and IT companies predominates.

Convergence and analytical implications

These two institutional configurations—the PIGA regulatory framework and the social dialogue tradition—converge in shaping data centre deployment in distinct ways. The PIGA defines the regulatory terrain that advantages corporate actors and regional government while marginalising municipalities, establishing parameters that constrain subsequent negotiations. Aragonese social dialogue provides unions with institutional resources that partially compensate for their limited structural power in an emerging sector with low employment density.

Together, these elements constitute the structural conditions shaping negotiation dynamics and outcomes. The following sections analyse how different actors operated within these institutional constraints and opportunities.

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3. Negotiation processes and social dialogue dynamics

3.1. Narratives and frameworks of public debate

This analysis first provides a descriptive and chronological overview of the main milestones in media coverage of data centre development in the autonomous community of Aragon. To do this, we compiled references to data centres in the local, regional and national press. We have used the latter as an indicator of the relevance of the issue in public debate, assuming that a greater national presence of aspects related to data centres implies greater centrality, beyond the local media ecosystem. An alternative media outlet (Arainfo) is also included as an example of the emergence of socio-environmental impacts in public debate. The presentation continues with a characterisation of the debate frameworks detected in the process, grouped around narratives on socio-economic development; employment and the industrial ecosystem; and the territorial dimension of digital and energy transformations.

Public debate in figures: a quantitative analysis

The systematic analysis of 1,653 articles from the Aragonese and national press (2019-2025) allows us to empirically characterise the narratives of the public debate on data centres. This corpus, which includes media outlets such as Heraldo de Aragón, El Periódico de Aragón, Arainfo, El País and El Mundo, reveals significant patterns about what has been discussed – and what has been absent – in the public sphere. In general, the discursive initiative corresponds to business and institutional actors, who drive 61.6% of the news, compared to 9.9% of occasions when the initiative or theme corresponds to critical movements or alternative positions, and less than 1% when the main actors are trade unions.

Table 1. Evolution of the main topics in media coverage (2019-2025)

Period	Employment	Digital transition	Green transition	Trade unions
2019-2021	18.7	26.6	8.7	0.4
2022	20.8	32.7	15.8	0.5
2023	17.3	24.8	21.8	0.6

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2024	4.5	12.7	9.7	0.5
2025	2.4	9.5	14.1	0.5
Source: own elaboration based on press corpus (n=1,653)				

The data reveals three key findings. First, the gradual disappearance of employment as a main topic, with mentions falling from 20.8% in 2022 to 2.4% in 2025. When focusing on investment dimensions, the more data centres are discussed (588 articles in 2025, an all-time high), the less employment is discussed. Second, the narrative shift between transitions: in 2025, for the first time, environmental issues (14.1%) surpass digital issues (9.5%), signalling a shift towards scrutiny of the model's costs. Third, and most relevant to this report, is the structural absence of the labour voice in public discourse, as trade unions appear in only 0.5% of articles, while issues such as wages, working conditions and collective bargaining are virtually absent from public debate as a central issue.

Table 2: Absence of labour issues in public debate. Press analysis (n=1,653 articles)

Issue	Mentions	% Corpus	Observations
General employment	105	6.4	Decline between 2019 and 2025
Training	86	5.2	Linked to initial speech
Salaries	4	0.2	Virtually absent
Working conditions	2	0.1	
Local recruitment	1	0.1	
TOTAL LABOUR ISSUES	162	9.8	Declining weight
Source: own elaboration based on press corpus (n=1,653)			

This absence of trade unions in the media does not necessarily imply an absence of real negotiation—as will be discussed later, there are processes of dialogue between trade unions and companies—but it does indicate that social dialogue around data centres has remained outside the public sphere, whether as a strategy, due to the weakness of labour actors in projecting their agenda, or due to media disinterest in these issues.

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On the other hand, analysis of public discourse on data centres in Aragon reveals a notable evolution in the dominant interpretative frameworks. Between 2019 and 2025, the narratives have shifted from initial technological optimism to a more nuanced debate that incorporates environmental and territorial concerns. This evolution can be characterised through the three main discursive frameworks that have structured the debate, to which we have already referred: that of the “European Virginia”, relating to attracting investment and socio-economic development; that of “the new General Motors”, in relation to the creation of a new industrial ecosystem with profound labour implications. Finally, there is a framework for the use of natural resources, but also for the emergence of socio-environmental impacts that reproduce dynamics of territorial inequality.

Discursive frameworks of the debate

Analysis of the public discourse surrounding data centres in local, regional and national media reveals a notable evolution in the dominant interpretative frameworks. Between 2019 and 2025, the narratives have shifted from initial technological optimism to a more nuanced debate that incorporates environmental and territorial concerns. This evolution can be characterised through three main discursive frameworks.

“The European Virginia”: development and integration into global socio-economic logic

The first dominant narrative framework is that of international competitive positioning within a logic of economic development. The recurring comparison with Northern Virginia's “Data Centre Alley” – the world's largest data centre corridor – has served as an aspirational benchmark for presenting Aragon as a territory capable of competing in the “world's premier league” of the digital economy. This narrative, particularly present in institutional discourse between 2019 and 2022, but which solidified from 2024 onwards with the characterisation of Aragon as the “European Virginia”, emphasises the comparative advantages of the territory: availability of land, access to renewable energy, connectivity with strategic telecommunications nodes and proximity to Madrid and Barcelona.

> I wish I could imagine what is going to happen in the world of technology and data, which is to say computing and artificial intelligence, an advance that some believe will be more important than electricity or the steam engine. We don't know what it will bring. But we do know that we are going to be the region in Europe with the highest investment in technology in the coming years. (Interview with Jorge Azcón, President of Aragon, El Confidencial, 23/04/2024).

This framework is distinguished by the constant use of investment figures as discursive resources: “Aragon faces a historic opportunity with investments of more than thirty-seven billion euros. Amazon, fifteen billion seven hundred million; Microsoft, ten billion; Samca, one billion; Blackstone, seven billion five hundred million” (Vidal Jiménez, VOX, plenary session of the Aragonese Parliament, 24/04/2025). These figures, which are always difficult to contextualise, are joined by the symbolic power of large companies as a resource for shaping consensus as a “historic opportunity”.

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"The new GM": highly skilled employment and the technological ecosystem

A second narrative framework has revolved around expectations for job creation. Initial projections were remarkably optimistic: figures of up to 6,800 direct and indirect jobs were mentioned for the AWS project alone (AD, 22/05/2024), with references to international experiences such as the 5,700 jobs created in Ireland. These promises were often framed in an implicit comparison with large industrial projects from the local past, such as the General Motors (Opel) factory in Figueruelas in 1982, now Stellantis. When the AWS data centre expansion project was made public, the figure rose to 17,800 announced jobs, a third of them in Aragon (About Amazon, 2024a).

However, analysis of media coverage reveals that while mentions of employment accounted for approximately 20% of articles between 2019 and 2022, this proportion fell dramatically to 2.4% in 2025. Even more striking is the fact that 2022, the year in which the first AWS centres actually opened, did not see a peak in coverage or any real follow-up on the jobs actually created. The narrative remained forward-looking ("will generate", "will create") even when the centres were already operational, with no systematic verification of the initial promises.

Understanding these dynamics requires attention to the specific structure of the sector. The life cycle of data centres goes through phases with very different labour intensities and regulatory systems: design, construction, commissioning and operation. Construction accounts for the bulk of employment, while operation requires smaller but more skilled workforces. The construction phase could employ between 8,000 and 11,000 direct workers in the years of peak activity in Aragón (Fundación Basilio Paraíso, 2025, p. 88). The companies involved – Acciona as the main contractor for AWS, together with Levitec, Itercon and Cobra – operate under the construction agreement. Operation, on the other hand, has radically different characteristics: at rates typically below two jobs per MW for hyperscale facilities, and often approaching one job per MW in highly automated centres (UII-Uptime Institute, 2020), most centres will have around 50 highly or moderately skilled workers when operating at full capacity.

"Using Aragon's energy in Aragon": discourses based on territory and energy transition

The third discursive framework has become more complex since 2024-2025, linking the arrival of data centres with broader debates on the territorial energy model. Aragón generates approximately 17% of the country's renewable energy with barely 3% of the population (Gobierno de Aragón, 2024), which has fuelled a discourse on the need for the benefits of this production to be reinvested locally. In 2024, former president Lambán complained to the new regional government that "data centres are not coming here because they like El Pilar or the Ebro, they are coming here because there is sustainable and cheap energy. And that already began with my governments" (Cadena SER, 2024). In other words, data centres would be an opportunity to consume locally energy that would otherwise be exported.

However, this narrative has also generated opposition. Analysis of the evolution of public debate shows that, for the first time in 2025, mentions of environmental issues (14.1%) exceeded mentions of digital transformation (9.5%). Movements such as "Tu Nube Seca Mi

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Río" (Your Cloud Dries Up My River) and environmental platforms have articulated a critique focused on the impacts on water and energy resources, questioning whether data centres represent an efficient use of Aragon's renewable capacity or whether, on the contrary, they compete with and "impede the development of other industries that are also strategic for the Aragonese government, such as green hydrogen" (Allegations..., January 2025) or other uses that are potentially more beneficial for the region.

3.2. Actors and coalitions in the development of data centres

Mapping the actors involved in the process of implementing data centres allows us to identify three main configurations: a coalition in favour of the development of these infrastructures, a group of actors with favourable but not fully aligned positions, and a more recently formed critical coalition.

Promoting coalition

The core of the promoting coalition is made up of AWS—as the main structuring actor—and the Government of Aragon. This alliance has remained stable through the change of regional government in 2023 (from the Socialist party-PSOE the the Popular Party -PP), demonstrating a bipartisan consensus on the desirability of attracting this type of investment. Although the previous relationship was already defined as 'fluid,' a union representative (Union-1) reports that after the 2023 elections, 'it has been noticed that there is a better relationship between Amazon and the government.' From 2023 onwards, with the flood of announcements about new data centres, the coalition expanded to include other business players involved in different links of the value chain, such as Microsoft, which stands as the second largest operator, diversified energy companies (Capital Energy/Box2Bit, SAMCA, Atalaya), construction companies such as Acciona, local technology companies in the ecosystem (Hiberus, DXC), and financial and real estate players such as Azora. University of Zaragoza is also involved, having established training and collaboration agreements with the big tech companies (Universidad de Zaragoza, 2025).

As we have already mentioned, the relationship between AWS and the regional government is characterised by privileged access to the administration and close collaboration in the processing of projects. As one journalistic source pointed out, when choosing the location for an investment, developers value the availability of teams of specialised civil servants to guide them through the entire process, and thus "the availability of land, water and energy were conditions that other candidates could meet, but creating a specific team was 'decisive' in convincing AWS" (This is how Amazon's arrival in Aragon came about, EPdA, 16/11/2019). In this space, professional and even personal relationships of trust and collaboration are forged, which facilitate—or hinder, depending on the case—the progress of projects, while shaping a collective identity around a socio-economic development project.

Actors not fully aligned

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In an intermediate position are the actors who, while supporting or not openly opposing the projects, maintain reservations or conditional positions. This group includes some of the municipalities affected (Villamayor, Villanueva, among others), whose positions have ranged from initial acquiescence to subsequent opposition when the projects have exceeded certain thresholds perceived as acceptable. The main trade unions (CCOO and UGT) also fall into this category. They have maintained general support for the implementation, but with significant nuances. CCOO, in particular, has expressed some moderate reservations and has developed a negotiation strategy aimed at ensuring that labour benefits are effectively realised. As one trade union representative pointed out, “ours is not I support you 100%, I support you 0%', that is not our role; our role is 'tell us everything, we will make proposals to improve it, to make it more sustainable in a broad sense'” (Union-1). The unions assert their institutional role in order to be present in the process, but this role and their limited strength in a recently established sector do not allow them to become a central part of decision-making on projects.

Critical coalition

The critical coalition has been mainly articulated since 2024-2025, although it has its roots in the broader criticism of the renewable energy implementation model developed by territorial movements. Two complementary lines converge in this coalition: on the one hand, a critique of the digital transition from ecological, educational and social perspectives, articulated especially by Ecologistas en Acción and, more recently, the initiative “No es sequía, es saqueo” (It's not drought, it's plundering); on the other, the movement to defend the territory against what is perceived as energy extractivism, organised around platforms such as “13 de marzo” (13 March) or Defensa de los Paisajes de Teruel (Defence of the Landscapes of Teruel).

A milestone in the formation of this coalition was the process of submitting arguments to the PIGA regarding the expansion of AWS in January 2025. A coalition of eight organisations—including Ecologistas en Acción, SEO/BirdLife, Ingeniería sin Fronteras and Tu Nube Seca Mi Río—submitted coordinated allegations (Allegations..., January 2025, citing company sources) that included specific data on water consumption (755,000 m³/year) and energy consumption (more than 10,800 GWh per year), questioning both the promises of employment and the opaque processing of the file. This collective action constituted the most extensive set of arguments ever made against data centres in Spain. In April 2025, the Aragonese Parliament unanimously approved the creation of a commission to study the effects of data centres. Likewise, on 26 September 2025, the Aragonese initiative “No es sequía, es saqueo” organised the first demonstration in Spain against data centres in Zaragoza (‘It's not drought,...’ Arainfo, 24/09/2025).

3.3. Power, strategy and negotiation tactics

The configuration of power resources, strategies and negotiation around data centres has distinctive characteristics that differentiate them from traditional social dialogue processes in the field of Spanish industrial relations. Firstly, the current configuration of the sector is still an emerging phenomenon. Until 2022, Spain had around 200 MW of installed power,

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which will multiply in just two years to reach approximately 600 MW in 2025. Secondly, companies impose a high degree of confidentiality, especially in the installation process, which means that working conditions are predetermined. Finally, the sector is characterised by low relative and absolute employment figures in the operational phase, with barely a hundred direct workers currently employed at local AWS centres. In the process in question, the main counterweight from the trade union side comes from institutional power, which not only gives them a role, but also provides an additional incentive for AWS to deal with labour relations through social dialogue.

Strategies on the business side

AWS has deployed a repertoire of strategies that includes both distributive and integrative bargaining elements. On the distributive side, the systematic use of confidentiality obligations stands out, limiting public scrutiny of the conditions agreed with the administrations and limiting the union's ability to use the data to which it has access to publicly influence the terms of the negotiation. Another of the main resources used is walk-away capacity (the ability to credibly threaten withdrawal to an alternative location), with two important restrictions: firstly, its limitation to the pre-construction phase and, secondly, the fact that it is mainly geared towards negotiating administrative and fiscal conditions with local authorities, rather than negotiating with workers. Indeed, in a context of inter-territorial competition to attract investment, companies can take advantage of their ability to choose between alternative locations to secure the most favourable conditions or a lower level of conflict. Furthermore, as a result of close collaboration between the company and the regional government, the political weight of these conflicts falls on the latter, while AWS declined to comment publicly.

At the integrative level, promises of employment and training have served as the main legitimising argument. AWS has established agreements with the University of Zaragoza and the regional government in relation to vocational training and training for workers, in order to adapt the training offer to its needs, which represents an attempt to link business interests with the development of regional human capital. AWS also uses its technological capabilities as a resource in negotiations with social partners, referring to the development of joint projects: “It's not a question of money, no: give us your tools and your artificial intelligence capabilities” (Union-1).

Trade union positioning and strategies

The response of the most representative trade unions is characterised by pragmatism aimed at maximising labour benefits within a process over which workers' organisations have limited influence in terms of strategic aspects. Significantly, since the launch of the AWS data centres in 2022, there have been no trade union elections, and therefore, “we have no representation at the three Amazon centres, there is no works council, so we'll just have to wait and see” (Union-2). This is due to the small number of workers, a perceived high turnover rate (“there are already small companies working in IT which are already losing staff”, Union-1) and strategic choices in the competition between unions. At the same time, it shows how limited the unions' associative and structural power resources are in this field, forcing them to shift their strategy to the institutional level where their power resources

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are more firmly established. In short, it is a temporary strategy until the sector's volume and influence are transformed into greater associative and structural power: “When this sector is growing, especially here in Aragon, it makes sense that it should have some kind of specific agreement, right? We'll see what the future holds” (Union-2).
In all likelihood, the most significant achievement of this strategy has been the negotiation of the applicable collective agreement. Once the facilities were inaugurated, and throughout 2023, the unions managed to impose the metal agreement – now called ‘metal industry, technology and services’ – over the less favourable alternative of the collective agreement for Consulting, Information Technology and Market and Opinion Research Companies, which is more common in the sector. As one union representative explained, the strategy was based on creative reasoning, because “at the end of the day, these are pieces of iron, pieces of iron through which data flows, but they are pieces of iron [...] We cling to the fact that they are pieces of iron and that this agreement is the one in which we have the most influence” (Union-1). This adaptation made it possible to incorporate clauses on training, qualifications and shift organisation that were more advanced than those available in other conventional frameworks.

3.4. Phases and characterisation

Beyond general positions and strategies, three distinct phases of negotiation can be identified, each with different participants, dynamics, and outcomes.

Phase 1: Investment negotiations (2018-2020)
Initial negotiations between AWS and the Government of Aragon were conducted through confidential channels before the public announcement in October 2019. The PIGA instrument served as the primary framework, with discussions centring on fiscal conditions, administrative facilitation, and land availability (De-la-Cal-Nicolás & Pemán-Gavin, 2025). The creation of a dedicated civil service team was described as “decisive” in convincing AWS to choose Aragon (EPdA, 16/11/2019). These negotiations were predominantly distributive: benefits secured by AWS (tax exemptions, streamlined procedures) implied costs absorbed by municipalities (lost tax revenue, reduced autonomy) and constraints on subsequent actors. Neither municipal authorities nor trade unions participated in defining these initial conditions.

Phase 2: Collective agreement negotiations (2020-2023)
The process leading to the inclusion of data centres in the regional metalworking agreement began earlier than publicly visible. Informal conversations between social partners started in 2020, shortly after the first confidential information about AWS investments reached union representatives. The metal employers' federation and trade unions (CCOO, UGT) identified a regulatory "grey zone" that could allow technology companies to opt for less favourable national-level agreements in consulting, engineering, or IT services. As Union-1 explained: "We said, let's put the band-aid on before the wound. Before this starts operating, we need to have it clear."

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Crucially, this was not a negotiation with AWS but rather an agreement between regional social partners presented to the company as a fait accompli: "It's not that we negotiated with Amazon. Amazon was simply told 'this is what we are doing' and Amazon said it seemed fine to them" (Union-1). By the time the metalworking agreement was formally signed in late 2023, the inclusion of data centres had been informally settled for nearly two years.

The "pieces of iron" argument provided the technical justification, while pre-existing institutional resources—established channels and shared expectations—enabled this proactive response to the emerging sector."

Phase 3: Training negotiations (2023-2025)

Training programme negotiations exhibited the clearest integrative dynamic, with partially aligned interests across parties. AWS required a skilled workforce adapted to its operational needs; the regional government sought to maximise local employment benefits; unions aimed to ensure quality jobs for regional workers. Agreements with the University of Zaragoza and vocational training centres and INAEM [regional employment agency] emerged from this convergence (About Amazon, 2024b; Convocatoria de subvenciones Plan Wave Plus Ocupados, 2025). Union participation, while consultative rather than decisive, allowed input into professional profile definitions:

> Therefore, we propose that they take advantage of the instruments we have for social dialogue, such as the Social Dialogue Roundtable, the INAEM's [regional employment agency] Forum for Prospecting and Analysis of the Labour Market, [...]. We need to anticipate the demand for trained personnel to channel everything we have [...] the people we have here, so that they can join these projects. [...] In general, university education, training, vocational training pathways with a range of training options. (Union-2)

However, tensions persisted around public employment projections, with unions privately cautioning against figures they considered inflated (see point 3.3 below).

Asymmetry and sequencing

A key finding concerns the relationship between these phases. Distributive outcomes in early negotiations (fiscal conditions, PIGA framework) constrained the scope for subsequent bargaining. Unions could negotiate the applicable agreement and influence training programmes, but not the fundamental terms under which data centres would operate in the territory. This sequencing—distributive negotiations establishing structural parameters, integrative possibilities emerging within those parameters—reflects the broader power asymmetry characteristic of inter-territorial competition for mobile investment (Brenner, 2005).

Table 3: Chronology of the data centre process in Aragon (2019-2025)

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Phase / Key events	Main actors	Negotiation characteristics	Predominant dynamic
PHASE 1: Negotiation and arrival (2018-2020)			
Oct 2019: AWS announcement (€2.5bn)	AWS, Government of Aragon	Confidential negotiations on PIGA conditions. Unions and municipalities excluded. Public narrative focused on job promises (reference: 5,700 jobs in Ireland).	Distributive
July 2020: PIGA AWS approval	AWS, Government of Aragon, (municipalities marginally)	Consolidation of regulatory framework. Fiscal exemptions and administrative facilitation secured.	Distributive
PHASE 2: Construction and start-up (2020-2023)			
2020: Informal conversations on collective agreement	CCOO, UGT, Metal employers' federation	Social partners identify regulatory "grey zone" for data centres. Pre-emptive agreement to include sector in metalworking agreement	Integrative (between social partners)
Nov 2022: Opening of AWS centres	AWS, construction companies (Acciona, others)	Construction under sectoral agreement. No significant labour conflict. Start of operations without verification of employment promises.	—
2022-2023: Collective agreement formalisation	CCOO, UGT, Metal employers' federation, (AWS informed)	Agreement presented to AWS as fait accompli. Union success in securing metalworking framework ("pieces of iron" argument)	Mixed / Integrative

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Phase / Key events	Main actors	Negotiation characteristics	Predominant dynamic
PHASE 3: Acceleration (May 2023-Nov 2024)			
Oct 2023: Microsoft announcement (€9.5bn)	Microsoft, Government of Aragon	Continuity of PIGA model with new government (PP-VOX). Expansion of business actors. Social dialogue framework maintained.	Distributive
2023-2024: Training negotiations	AWS, Government, Universities, Unions	Agreements on workforce development. Union consultation on professional profiles. Partially aligned interests.	Integrative
PHASE 4: Tensions and response (Dec 2024-present)			
May 2024: AWS expansion (€15.7bn total)	AWS, Government of Aragon	Intensification of investments. Employment disappears from public debate (4.5% mentions).	Distributive
Jan 2025: PIGA allegations (expansion)	Environmental coalition (8 organisations), AWS, Government	First coordinated critical action. Unions do not participate. Questioning of water/energy consumption and employment promises.	—
Apr 2025: Parliamentary commission	All parliamentary parties	Unanimous creation of study commission. First institutional recognition of controversy.	—
Sept 2025: First demonstration	Civil society, environmental movements	Narrative reversal: environmental issues surpass digital for first time in public debate.	—

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4. Analysis of the local level in the dynamics of social dialogue

The fundamental premise of this section is that the local and regional levels have been almost exclusively responsible for the implementation of AWS and other actors' infrastructure in the Zaragoza metropolitan area. This observation is valid in general terms, insofar as the negotiation process between the company and the regional government, the legal tools and the dialogue with other local actors have been almost exclusively governed by regional and local logic, and it was only recently (November 2025) that the central government intervened by enacting a Decree Law (Audiencia e información pública sobre el proyecto de Real Decreto por el que se regula la eficiencia energética y la sostenibilidad para los centros de datos, 2025)– pending validation – on Data Centres that aims to regulate the sector's operations and its integration into economic and industrial policies at the state level. However, this observation also applies to labour relations, insofar as its deployment has been compartmentalised and isolated from other divisions of Amazon and AWS, and the regional structures of the trade unions have negotiated collective agreements and other elements of employment policy, such as training, at the provincial and Aragonese levels. This identification between the general process and local dynamics determines its characterisation and analysis.

4.1. Results of the process and direction of change

Sticking to this scale, this process of implementing data centres in the Aragon region has generated different results depending on the different areas of analysis. In terms of attracting investment, it can be considered successful from the perspective of the promoting coalition: AWS operates several centres and has announced expansions, Microsoft has confirmed its campus in different locations, not without some uncertainties: (Microsoft extends the deadline for completing its three data centres in Aragón to fifteen years, EPdA, 05/05/2024), and multiple business actors have expressed interest in establishing themselves in the territory. However, in the area of labour relations, the results are more ambivalent. Indeed, a relatively favourable conventional framework has been established through adherence to the metalworking agreement, but trade union participation in strategic decisions on projects has been peripheral. The institutions of Aragonese social dialogue have functioned in the case of AWS as a coordination mechanism and, to a lesser extent, as a space for commitments on job creation or working conditions.

The overall direction of the process can be characterised as an adaptation of the territory to the needs of global economic actors, rather than a negotiated transformation in which the various territorial interests have had an equal say. Instruments such as the PIGA have facilitated this adaptation, but they have also been criticised for limiting citizen participation and public scrutiny. The recent creation of a parliamentary analysis committee indicates a recognition that the governance model applied to date has shortcomings that need to be addressed.

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4.2. The municipal level: tensions between adaptation and resistance

The dynamics at the municipal level illustrate the characteristic tensions between the regional logic of attracting investment and local interests. The municipalities affected are in a structurally weak position vis-à-vis the PIGA instrument, which transfers powers to the regional level and reduces or eliminates municipal tax revenues. As early as 2019, when the first announcement of AWS investments, the mayor of Villanueva de Gállego complained about the tax loss that the implementation model would entail (The DGA [regional government] reprimands Villanueva de Gállego for demanding taxes from Amazon, EPdA, 15/01/2020). In response, the president of Aragon pointed out that there are "728 other municipalities in Aragon eager for Amazon to set up shop" (EPdA, 15/01/2020), while AWS declined to comment.

Although companies other than AWS operate there, the case of Villamayor de Gállego is illustrative. After accepting a first Microsoft data centre, the mayor's office expressed surprise and opposition ("we are prepared to do whatever it takes") to the announcement of a second Azora project in 2025, reflecting a feeling of "sacrifice already made" and the perception that acceptance was taken for granted without prior consultation (El pueblo aragonés que se moviliza contra un centro de datos, El País, 11/05/2025). When the municipality expressed its intention to appeal the regional declaration of general interest for a second data centre due to the socio-territorial impacts and the loss of municipal autonomy, the Regional Minister for Development himself publicly expressed the institutional commitment to the PIGA instrument: "from a reputational point of view, we are not going to allow a figure such as the PIGA to be tarnished [...] And if we have to redo the PIGA, we will do so" (Villamayor se planta… EpdA, 13/05/2025). Similar reactions, with varying degrees of intensity, can be cited in the localities affected by the SAMCA projects (Luceni, Pedrola), and again with regard to AWS in Villanueva de Gállego, whose council filed an appeal in court on 30 November (Villanueva de Gállego opens the first legal battle against a data centre in Aragón, HdA, 30/11/2025).

One of the main dimensions of local criticism is a deep-rooted view of job creation as compensation for socio-environmental impacts or tax exemptions; however, political actors in affected localities have expressed scepticism about the real impact on local employment: "1,200 jobs... There are not going to be many jobs at Amazon, no way, not even for the people in the village. But that's not the case with all the others that have been created" (Local-1). These criticisms are based in part on previous experience with renewable energy projects, where "thousands of jobs were also promised and practically nothing has been created, especially in the region" (Local-1)

The approach is similar in environmental organisations, which point out that "the issue of jobs is the biggest lie that appears in all projects", arguing that the employment they promise "in the PIGAS and DIGAS themselves is enormous", while "we have seen, from what Amazon is already doing in Aragon, that it is well known but also from what all data centres around the world are doing, that the number of jobs is much lower, as little as a tenth of what they promise" (Environmental-1).

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4.3. Pre-existing institutions and their evolution

The pre-existing Aragonese institutions for social dialogue have conditioned and modulated the reception of the data centre sector. The tradition of uninterrupted consultation since 1989 and the stable channels between actors provided a framework for dialogue that did not exist in other territories. The metalworking agreement, with its provincial and regional scope, offered an instrument that could be adapted to new activities.

The union's strategy has been based on leveraging these institutional resources to secure better working conditions within the framework of reasonable investments; the discourse integrates possible contradictions because, linking the AWS issue with the experience of the closure of coal mining, “it may happen that fifteen years after setting up the data centres, they close [...] and whoever is in this office may have to stand on a picket line defending their jobs” (Union-1). The trade unions, with their limited public profile on this issue, draw a distinction between the potential for development (‘no, investment, investment, I have never questioned that’, Union-1) and its translation in terms of employment:

> “That's where there were some distortions, [...] and of course, 16,000 [jobs], well, that's a bit of a sum... we already know about the transitions in mining, and we've seen this many times before, with companies that come to you with an investment and say, 'we're going to create 200 jobs', and you read about the investment and... [shakes head].” (Union-1)

However, this strategy has its limitations. The institutional channel, combined with the confidentiality that operates in the process, restricts the public presence of trade unions and their strategic use in negotiations. In fact, their moments of greatest visibility occur alongside the company and the employers' side of the social dialogue, as in the meeting held in February 2025 after the presentation of allegations against the expansion by environmental groups (Social partners give the green light to the AWS expansion, AD, 20/02/2025). This ambiguity in their role is a source of tension:

> “There is a difference between what we are saying, which is always preceded by the word 'confidential', and what is then presented publicly. [...] We told them, 'You can't publicly announce 16,000 jobs—as happened at an event [in May 2024]—because if we now start talking about training and qualifying people with 16,000 tech jobs in mind and then it turns out there aren't 16,000, we're going to create a big problem. We're going to have 16,000 people who have committed to training and won't be able to work in that field because those aren't the jobs you're creating'. That [negotiating with AWS] allowed us to structure our training needs well: we need university graduates, higher degrees, vocational training, intermediate vocational training, maintenance, security, cleaning.” (Union-1)

The above quote shows the aforementioned tension, but also the capacity for effective advocacy and informal mechanisms. On the other hand, despite the ability to intervene at a

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general level (agreements, training, etc.), the strategy based on discretion and a form of social dialogue closely linked to the specific case of data centres shows limitations in reaching the bulk of the workforce – construction and subcontractors during operation – or other areas of Amazon such as logistics.

The development of interpersonal trust between union representatives and AWS management contributed to the fluid quality of dialogue. A personal connection emerged when AWS's local representative, who had previously worked at Telefónica, recognised shared professional background with the lead union negotiator: "A connection developed outside the formal meetings... it hasn't shaped the negotiations at the table, but when there have been difficulties, he has called me" (Union-1). This attitudinal dimension facilitated informal problem-solving while maintaining separation between institutional channels and personal relationships

The evolution of inter-party attitudes reveals the ambivalent role of Aragonese institutional trends. On one hand, the established framework of social dialogue enabled a relatively smooth incorporation of a new sector and a global actor unfamiliar with Spanish labour relations. Trust developed through repeated interactions in recognised institutional settings —the Social Dialogue Committee, sectoral bargaining tables, training coordination forums. On the other hand, this institutionalised trust operates within constraints that generate tension. Confidentiality requirements enable frank private exchanges but prevent unions from mobilising public opinion as a negotiating resource. The February 2025 meeting following environmental groups' allegations illustrates this ambiguity: unions appeared alongside corporate and government representatives, their visibility occurring in alignment with rather than in opposition to company positions.

Distributive effects: socio-economic equality and inclusiveness

Issues of equality and inclusiveness have played a marginal role in the public debate on data centres. The dominant discourse has focused on aggregate figures – total investment, promised jobs, impact on GDP – without paying sufficient attention to how costs and benefits are distributed among different social and territorial groups. From a territorial perspective, there is tension between the benefits that are concentrated at the regional or metropolitan level and the impacts that are localised in specific municipalities. Rural or peri-urban communities that host data centres perceive an imbalance between the effects on the landscape, the consumption of resources and local infrastructure, while much of the skilled employment and added value may end up being located in the city of Zaragoza or even outside Aragón. As one local informant pointed out: “How many of them work at Amazon? All of them. How many go out to the village? None. How many come in? None” (Local-1). This sectoral structure generates a characteristic tension: construction employment is intensive but temporary, while operational employment is stable but scarce and concentrated in profiles that do not necessarily correspond to the local labour supply. As our local informant pointed out: “from there [referring to the number of students in regional secondary schools] there are not going to be any engineers for the data centre” (Local-1).

Both in public discourse and in the available data, there are persistent doubts about the potential impact of pre-existing labour gaps on the data centre sector. Thus, in terms of

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gender, the available documentation does not show any specific equality policies in recruitment for data centres, beyond general legal obligations. Given that both the construction and technology sectors have historically had significant gender biases (González Ramos et al., 2017; Recalde-Esnoz et al., 2022), the absence of specific measures represents a significant gap. The same can be said about the training gap. The professional profiles required for data centre operations – specialised technicians, engineers, cybersecurity professionals – presuppose levels of training that are not evenly distributed across the territory. Although training initiatives linked to projects have been developed (agreements with universities, vocational training programmes: Amazon to "recycle" unemployed Aragonese workers, EPdA, 13/06/2024), there is a concern that higher-quality jobs will end up being filled by professionals from other regions, limiting the local redistributive impact. In fact, in contrast to the perception or discourse about the digital economic transformation of Aragon, the region ended the 2019-2024 period with a net and relative loss of technology jobs (Fundación COTEC, 2025).

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5. Conclusions

The case study illustrates a specific type of technological disruption: the territorialisation of global digital infrastructures. Unlike other digital transformation processes – characterised by offshoring, automation or job insecurity – the implementation of hyperscale data centres generates specific demands for territorial anchoring: land, energy, water, connectivity and favourable regulatory frameworks. This materiality of the "cloud" turns territories into competitors for attracting investments that, paradoxically, require intensive use of local resources but generate limited direct employment. In the Aragonese context, the disruption did not consist of the destruction of existing jobs or the transformation of traditional sectors, but rather the emergence of a new sector that raised questions about its fit within pre-existing institutional frameworks: which collective agreement should be applied? How should negotiations be conducted with global corporate actors with no tradition of social dialogue? How should costs and benefits be distributed territorially?

The analysis reveals different effects depending on the level considered. In sectoral collective bargaining, the main result has been the adaptation of the Aragonese metal agreement to incorporate new activities, a creative response that illustrates the adaptive capacity of social dialogue institutions. At the company level, the relationship with AWS has established channels of dialogue described as fluid but characterised by opacity, generating tension between institutionalised social dialogue practices and corporate practices in the global technology sector. At the territorial level, the PIGA instrument has prioritised administrative agility over local participation, while in the public debate, press analysis reveals a paradox: trade unions appear in 0.5% of articles and collective bargaining in 0%, suggesting that social dialogue has operated in circuits separate from media coverage.

The general direction of change can be characterised as institutional adaptation with limits. Aragonese social dialogue institutions have shown the capacity to absorb the new sector without structural transformations, thanks to pre-existing resources such as the tradition of uninterrupted consultation since 1989, stable channels between actors, and a culture of consensus that has withstood changes in government. However, this adaptation has its limits: subcontractors remain on the margins of the negotiated frameworks, municipalities lack effective mechanisms for participation, and the employment figures announced have not been subject to public monitoring. The attitudinal transformation observed—from mutual uncertainty to institutionalised trust—represents both an achievement of Aragonese social dialogue traditions and a potential limitation, as cooperative relationships may constrain unions' capacity for public contestation when strategic disagreements arise.

Several lessons emerge from this case for future social dialogue and policymaking around technological transitions. First, pre-existing institutional resources matter decisively: Aragonese unions' capacity to secure the metalworking agreement derived directly from three decades of uninterrupted social dialogue trajectory, suggesting that regions lacking such institutional infrastructure may face greater difficulties in shaping the terms of technological deployment. Second, creative adaptation can yield results within constraints:

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the “pieces of iron” argument demonstrates how actors can reframe emerging sectors to fit existing regulatory frameworks, though such strategies require established channels of communication and mutual recognition between parties. Third, the sequencing of negotiations shapes outcomes: distributive decisions made early in the process (PIGA conditions, fiscal exemptions) constrained the scope for subsequent integrative bargaining, indicating that early inclusion of social partners and municipalities could expand the range of negotiable issues. Fourth, transparency and public scrutiny remain challenging: the combination of corporate confidentiality requirements and institutionalised trust created a social dialogue that operated effectively but largely outside public view, raising questions about democratic accountability in major infrastructure decisions. Finally, monitoring mechanisms for employment commitments are essential: the gap between announced job figures and verified outcomes suggests that future policy frameworks should incorporate systematic tracking of employment promises as a condition for public facilitation of investment projects.

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6. References

6.1. Research literature

Altenried, M. (2022). *The Digital Factory: The Human Labor of Automation*. University of Chicago Press.

Brenner, N. (2005). *New State Spaces: Urban Governance and the Rescaling of Statehood*. Oxford University Press.

Climent López, E. A. (2024). Posibilidades y límites de la ordenación territorial mediante instrumentos especiales: El caso de Aragón. *Ciudad y territorio: Estudios territoriales*, 219, 49-70.

Constantinides, P., Henfridsson, O., & Parker, G. G. (2018). Platforms and Infrastructures in the Digital Age. *Information Systems Research*, 29(2), 381-400. https://doi.org/10.1287/isre.2018.0794

Crawford, K. (2023). *Atlas of AI: Power, Politics and the Planetary Costs of Artificial Intelligence.* Ned Ediciones.

De-la-Cal-Nicolás, P., & Pemán-Gavin, I. (2025). Urbanismo y planificación territorial de la Comunidad Autónoma de Aragón: Cuatro décadas de leyes y planes para un sistema urbano dual. *Ciudad y Territorio Estudios Territoriales*, 57(224), 921-940. https://doi.org/10.37230/CyTET.2025.224.22

Edwards, D., Cooper, Z. G. T., & Hogan, M. (2025). The making of critical data centre studies. *Convergence*, 31(2), 429-446.

Germán Zubero, L. G. (2012). *Historia económica del Aragón contemporáneo*. Prensas de la Universidad de Zaragoza.

González Monserrate, S. (2022). The Cloud Is Material: On the Environmental Impacts of Computation and Data Storage. *MIT Case Studies in Social and Ethical Responsibilities of Computing,* Winter 2022.

González Ramos, A. M., Bosch, N. V., & García, J. S. M. (2017). Women in the Technology Labour Market. *Revista Española de Investigaciones Sociológicas (REIS)*, 159(159), 73-89. https://doi.org/10.5477/cis/reis.159.73

Jones, N. (2018, September 12). How to stop data centres from gobbling up the world's electricity. *Nature.*

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Mosco, V. (2015). *To the Cloud: Big Data in a Turbulent World.* Paradigm Press.

Narayan, D. (2022). Platform capitalism and cloud infrastructure: Theorising a hyper-scalable computing regime. *Environment and Planning A: Economy and Space*, 54(8), 1596-1615.

Recalde-Esnoz, I., Ferrández, D., Dorado-Escribano, G., & Morón, C. (2022). Resistencia ante las políticas de igualdad de género en el sector español de la ingeniería de edificación. *Informes de la Construcción*, 74(567), e459. https://doi.org/10.3989/ic.91684

Srnicek, N. (2016). *Platform Capitalism*. Polity Press.

Winseck, D. (2017). The Geopolitical Economy of the Global Internet Infrastructure. *Journal of Information Policy*, 7, 228-267. https://doi.org/10.5325/jinfopoli.7.2017.0228

6.2. Original sources

Policy and administrative documents

This section includes a selection of the most relevant or frequently cited documents in this work. In any case, all DIGA/PIGA legislation and declarations are available on the Aragon Government website dedicated to this topic.

Gobierno de Aragón (2008, 30 October). Decree Law 1/2008, of 30 October, of the Government of Aragon, on urgent administrative measures to facilitate economic activity in Aragon, *Boletín Oficial de Aragón*. https://www.boe.es/buscar/doc.php?id=BOA-d-2008-90036

Gobierno de Aragón (2009, 17 June) Law 3/2009, of 17 June, on Urban Planning in Aragon, *Boletín Oficial de Aragón* (124). https://www.boe.es/eli/es-ar/l/2009/06/17/3

Gobierno de Aragón (2015, 17 November). Legislative Decree 2/2015, of 17 November, of the Government of Aragon, approving the revised text of the Law on Land Use Planning in Aragon. *Boletín Oficial de Aragón* (225). https://www.boe.es/buscar/act.php?id=BOA-d-2015-90603

Gobierno de Aragón (2018, 8 February). Law 1/2018, of 8 February, on social dialogue and institutional participation in Aragon. *Boletín Oficial de Aragón* (37). https://www.boe.es/eli/es-ar/l/2018/02/08/1

Gobierno de Aragón (2021, 24 February) Law 1/2021, of 11 February, on administrative simplification in Aragon. *Boletín Oficial de Aragón*.

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Gobierno de Aragón (2020, 20 july). Decree 132/2020, of 10 July, of the Government of Aragon, declaring the Project of General Interest of Aragon called “Data Centre AWS Aragon”. *Boletín Oficial de Aragón*.

Gobierno de Aragón (2024, 13 december). ORDER FOM/1517/2024, of 4 December, initially approving the Plan of General Interest ‘Expansion of the AWS Region in Aragon’. *Boletín Oficial de Aragón.* https://www.boa.aragon.es/cgi-bin/EBOA/BRSCGI?CMD=VEROBJ&MLKOB=1366240321010&type=pdf

Cortes of Aragon (2025, 24 april). Non-legislative proposal on the creation of a commission to study the effects of data centres. Approved unanimously. *Diario de Sesiones de las Cortes de Aragón*.

Ministerio de Transición Ecológica (2025). Audiencia e información pública sobre el proyecto de Real Decreto por el que se regula la eficiencia energética y la sostenibilidad para los centros de datos, No. N/D, *Consejo de Ministros*. https://www.miteco.gob.es/es/energia/participacion/2025/detalle-participacion-publica-k-775.html

Instituto Aragonés de Empleo (2025, september 23) Convocatoria de subvenciones Plan Wave Plus Ocupados, EMC/1217/2025. *Boletín Oficial de Aragón*.

Collective agreements

Departamento de Economía, Empleo e Industria. (2023, 23 de diciembre). Collective agreement for the metal industry, technology and services sector in the province of Zaragoza (2023-2025). *Boletín Oficial de la Provincia de Zaragoza*, (293).

Dirección General de Trabajo (2023, 13 july). 18th State Collective Agreement for Consulting, Information Technology, Market Research and Public Opinion Polling Companies. *Boletín Oficial del Estado,* (177). https://www.boe.es/eli/es/res/2023/07/13/(5)

Reports and studies

Fundación Basilio Paraíso. (2025). *Data centres: General context and framework for analysis*. Zaragoza.

Fundación COTEC. (2025). *Mapa del Empleo Tecnológico de España 2025*. Fundación COTEC. https://cotec.es

Gobierno de Aragón. (2024). *Plan Energético de Aragón (2024-2030)*. Gobierno de Aragón. https://www.miteco.gob.es/es/energia/estrategia-normativa/pniec-23-30.html

Funded by the European Union

Funded by the European Union under G.A. NO 101178146. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Gobierno de Aragón. (2024). *Boletines de coyuntura energética en Aragón. Gobierno de Aragón.* https://www.aragon.es/-/boletines-de-coyuntura-energetica-en-aragon

Goldman Sachs. (2024). *Powering Up Europe: AI datacenters and electrification to drive +c.40%-50% growth in electricity consumption* (Equity Research). https://www.goldmansachs.com/insights/goldman-sachs-research/electrify-now-powering-up-europe

Hart, J., Shearer, S., & Ryan, P. (2025). *Powering the Future* (No. 29; Data Centre Survey, p. 40). BCS & Ix Consulting. https://bcsconsultancy.com/insights/thought-leadership/powering-the-future

International Energy Agency. (2025). *Energy and AI (World Energy Outlook Special Report*. International Energy Agency. https://www.iea.org/reports/energy-and-ai

MITECO. (2024). *Plan Nacional Integrado de Energía y Clima (PNIEC 2023-2030).* MITECO. https://www.miteco.gob.es/es/energia/estrategia-normativa/pniec-23-30.html

Pina, M. (2019). 30 años de DIÁLOGO SOCIAL en Aragón. *Trabajo Sindical*, 127.

UII-Uptime Institute. (2020). *The people challenge: Global data center staffing forecast 2021-2025* (Keynote No. 43; UII Keynote Report). https://intelligence.uptimeinstitute.com/resource/people-challenge-global-data-center-staffing-forecast-2021-2025

Press sources

Regional and national press corpus (2019-2025). 1,653 articles from: Heraldo de Aragón (HdA, n=558), El Periódico de Aragón (EPdA, n=413), Arainfo (n=37), Diario del Alto Aragón (n=106), Aragón Digital (AD) and other national and local media. The database used can be found in this repository. Below is a selection of the most relevant articles or those not included in the database:

About Amazon. (2024a, may 22). AWS planea invertir 15.700 millones de euros en España, apoyando la creación de más de 17.500 puestos de trabajo de forma anual en negocios locales. *ES About Amazon*. https://www.aboutamazon.es/noticias/aws/nueva-inversion-de-15700-millones-de-aws-en-espana

About Amazon. (2024b, june 12). Amazon Web Services lanza 'AWS re/Start' en Aragón, un programa de formación en habilidades cloud para personas desempleadas y subempleadas. *ES About Amazon*. https://www.aboutamazon.es/noticias/aws/amazon-web-services-lanza-aws-re-start-en-aragon-un-programa-de-formacion-en-habilidades-cloud-para-personas-desempleadas-y-subempleadas

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Cadena SER. (2024, november 3). Lambán: «Los centros de datos no vienen aquí porque les guste el Ebro, vienen por las renovables y eso ya comenzó con mis gobiernos» [Broadcast]. En Cadena SER. https://cadenaser.com/aragon/2024/11/03/lamban-los-centros-de-datos-no-vienen-aqui-porque-les-guste-el-ebro-vienen-por-las-renovables-y-eso-ya-comenzo-con-mis-gobiernos-radio-huesca/

Gobierno de Aragón. (2025, november 12). Aragón alcanza los 70.000 millones de euros en inversiones empresariales desde el inicio de la legislatura. *Aragón Hoy*. https://www.aragonhoy.es/presidencia-de-gobierno/aragon-alcanza-70-000-millones-euros-inversiones-empresariales-inicio-legislatura-102699

Llorente, A. (2025, november 24). Microsoft se niega a pagar 53 millones de euros a La Muela y 34 a Villamayor de Galligo en impuestos por la construcción de su 'nube'. *AraInfo · Diario Libre d'Aragón*. https://arainfo.org/microsoft-se-niega-a-pagar-53-millones-de-euros-a-la-muela-y-34-a-villamayor-de-galligo-en-impuestos-por-la-construccion-de-su-nube/

Microsoft. (2023, octubre 23). Microsoft anuncia su intención de construir un campus de centros de datos en Aragón para proporcionar servicios de nube inteligente a empresas y organizaciones públicas europeas. *Source EMEA - Microsoft*. https://news.microsoft.com/source/emea/features/microsoft-anuncia-su-intencion-de-construir-un-campus-de-centros-de-datos-en-aragon-para-proporcionar-servicios-de-nube-inteligente-a-empresas-y-organizaciones-publicas-europeas/

Sierra, Á., & Crespo, G. (2024, april 23). Azcón: «Aragón va a ser en los próximos años la región de Europa con más inversiones tecnológicas». *elconfidencial.com*. https://www.elconfidencial.com/espana/aragon/2024-04-23/entrevista-azcon-aragon-optimista-region-europa-tecnologia_3871037/

Universidad de Zaragoza. (2025, noviembre 7). El Gobierno de Aragón y Amazon Web Services lanzan un ecosistema integral de formación en Inteligencia Artificial. *Actualidad UNIZAR*. http://www.unizar.es/noticia/el-gobierno-de-aragon-y-amazon-web-services-lanzan-un-ecosistema-integral-de-formacion-en

Interviews

Trade union representative 1 (Union-1). Semi-structured interview, November and December 2025, Zaragoza.

Trade union representative 2 (Union-2). Semi-structured interview, December 2025, Zaragoza.

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Funded by the European Union under G.A. NO 101178146. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Environmental organisation representative. Semi-structured interview, November 2025, Zaragoza.

Member of local social and political organisations, in one of the municipalities with AWS data centres . Semi-structured interview, November, 2025.

Other primary sources

Coordinated allegations to the Aragón Project of General Interest for the expansion of AWS. Submitted by Ecologistas en Acción, Tu Nube Seca Mi Río, SEO/BirdLife, Ingeniería sin Fronteras and other organisations, January 2025. https://tunubesecamirio.com/2025/01/22/presentamos-alegaciones-de-manera-conjunta-contra-centros-de-datos-de-amazon-en-aragon/

Press conferences of the Aragon Social Dialogue Committee (2019-2025). Government of Aragon.

Environmental impact assessments of data centre projects in Aragon (2020-2025). Aragonese Institute for Environmental Management (INAGA).

Funded by the European Union

Funded by the European Union under G.A. NO 101178146. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them.