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# Energy transition or transformation? Power and politics in the European natural gas industry's *trasformismo*

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### ABSTRACT

This paper explores how established natural gas interests responded to climate action in the European Union. Climate policy was initially not anticipated to reduce the role of natural gas in the energy system, if anything, many presumed that it would come to play a larger role. It was widely understood to be the transition fuel, entailing that it could substitute more carbon-intensive source-fuels, such as coal, as society decarbonises. This narrative complemented natural gas industry incumbents' other forms of power, including their control over resources, infrastructure, and involvement in the policy-making process. Drawing on these, they presumed that their future was ensured in the shift towards a low carbon energy system. As the EU enhanced climate targets, incumbents were forced to adapt the fuel's discourse according to the changing context. Incumbents deployed their material, organisational, and discursive power to extend the status quo and accommodate pressure to enact far-reaching change – a process Gramsci refers to as *trasformismo*. By tracing the natural gas industry's response to climate action, this paper shows how incumbents draw upon their fuel-specific bases of power and it explores the importance of discourses in shaping the trajectory of the energy transition.

## 1. Introduction

The EU's bid to meet its climate targets have led it to reconsider the role natural gas can play in its energy system. Decarbonisation drives the reconfiguration of its energy system, which carries immense ramifications for fossil fuel interests. To counter their demise, they have drawn on their powers to resist change or maintain their relevance. This article explores how natural gas interests respond to climate action in the EU and proposes that the transition fuel discourse has been essential to ensure what many thought was the fuel's stable role in the energy mix for decades to come. The rising stringency of climate action has led policy-makers to question this role, which prompted actors from within the sector to adapt their narratives as well as leverage other forms of power to ensure the survival of their industry.

The threat of climate change requires swift and effective action, which includes the elimination of carbon-intensive energy production. In a report commissioned by Friends of the Earth Europe, Anderson and Broderick ([1]: 43) underscore this when writing that “fossil fuels, *including natural gas* [emphasis added], can have no substantial role in an EU 2 °C energy system beyond 2035”. To phase out fossil fuels, society has to develop a robust understanding of how established interests resist

the reconfiguration of the status quo. Amongst these interests are those related to natural gas, which was widely seen as the transition fuel that can help reduce emissions by substituting more polluting fossil fuels and complementing intermittent renewables. This perception is shifting as scientists better understand the implications of the methane leaks that go along with natural gas consumption and the risks that the continued reliance on emitting fossil fuels pose [2-6].

Scholars have only recently begun to explore how natural gas interests respond to climate policy and the energy transition – this is the gap in the literature that this paper addresses. Most EU-focused natural gas scholarship has gravitated to the international political affairs of this fuel [7-12] or the governance of its market [13-15]. Climate considerations have generally been sidelined, apart from a few recent additions to the field [16-19]. Meanwhile, the literature has only recently turned to explore how the particularities of fuels and specific forms of incumbency shape energy transitions [20-23].

This paper develops a neo-Gramscian framework to assess the bases of power natural gas sectoral incumbents draw upon in their response to the EU's climate policy. It proposes that to attain a deeper understanding of the forces that shape the energy transition, it is essential to theorise the link between the physical properties of the fuel; the production,

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resources, and infrastructure sectoral interests control; the social and political practices in relation to its consumption; and the socially constructed narratives. To explore these dynamics, this paper traces EU climate and natural gas policy between 2009 and 2019. It also introduces historical forces shaping events that precede this interval, where necessary.

This paper is structured as follows, first it introduces the theoretical approach and framework. In section three, it provides an overview of the research design [24] and methodology. Section four explores how established interests drew on various forms of power to shape natural gas' role in the energy transition. It is structured into six sub-sections that discuss research results largely in a chronological manner. Section five discusses findings in-light of the theoretical framework. Lastly, section six briefly draws conclusions.

## 2. Analytical framework: A neo-Gramscian approach to incumbency response

The climate crisis has prompted a multitude of scholarly inquiries on how energy transitions unfold – this journal is a testament to this, given its focus and commitment to the matter. Initially, these inquiries tended to focus on how new technologies diffused, but Steen and Weaver ([25]: 1071) pointed out in 2017 that “few studies have explored incumbents' responses to [energy] transition processes”. Numerous papers have since addressed this gap in the literature [26-33]. These provide key insights on the behaviour of *incumbents*, which Newell ([34]: 81) defines as “those actors that benefit from the status quo and are thus likely to resist change”. Inquiries have, however, raised further questions, leading Turnheim and Sovacool ([23]: 181) to call for a need to “pluralise” incumbency by exploring “1) a multiplicity of incumbent actor types, 2) a variety of actor strategies within (and across) organisational populations, 3) the transient nature of strategic positioning (over time), and 4) the varied resources that incumbents may deploy to support transformative change”.

A neo-Gramscian framework allows for the theorisation of incumbency in a manner that conceptualises the sources of power that incumbents draw upon in a particularly historical and geographical setting [35,36]. This approach is rooted in Antonio Gramsci's [37] work on how political factions struggle to establish social dominance. A key concept the Italian thinker introduced is *hegemony*, which is the act of power-wielding over society through a combination of coercion and consent. Scoones, Leach and Newell ([38]: 87) suggest that hegemony is reliant on “[a] hegemonic social structure, or an ‘historical bloc’ [... i.e.] the alliances among various social groupings and also to the specific alignment of material, organizational, and discursive formations which stabilize and reproduce relations of production and meaning”. Actors and political factions rely on a combination of material, discursive, and organisational power to maintain their hegemony and thereby sustain their incumbency. Currently, a nuclear and fossil fuel dominated grey historical bloc is in place within the EU, but this is being challenged by its green alternative supported by renewable interests [39].

Incumbents can draw upon three bases of power to maintain a historical bloc: material, discursive, and institutional [37]. Material power pertains to the relations of production, i.e. the economic power that actors possess. Harvey ([40]: 78) suggests that discourse is also a “manifestations of power”, which according to Phillips, Lawrence and Hardy ([41]: 636) is composed of “structured collections of meaningful texts”. Third, Levy and Scully ([42]: 975) refer to institutional or organisational power when “[i]nstitutions reproduce themselves by establishing routines, disciplining deviance, and constructing agents' identities and interests”. These forms of power interact in a dialectical manner, as they continuously cross-influence one-another, reinforcing or reconfiguring existing power relations. Actors and political factions use these forms of power to wield their influence, shaping the actions of the state and, more broadly, society [43]. This paper shows how the EU's natural gas industry relies on these three bases of power, underscoring

the role of discursive power in relation to climate policy, which has been neglected from most analyses – for an exception see Stern's [18] recent paper.

The EU's goal to decarbonise has amplified the role of discourse as a medium through which actors seek to influence the socio-technological trajectory of the energy transition [44-47]. How discourse encodes energy carriers influences the future prospects of incumbents. This enhances the impact of *story-lines* or *narratives*, which Scrase and Ockwell ([48]: 2228) argue are “symbolic references that imply a common understanding of an issue [...] By uttering a specific word or phrase [...] a whole story-line is in effect re-invoked [...] They can thus act to define policy problems while obscuring underpinning interests, values and beliefs”. Incumbents support certain narratives to shape how others see a given resource and its future role. For instance, this may include emphasising a resource's compatibility with climate goals, such as “clean coal” [49] or “bridge fuel” [47,50]. The contents of this narrative, as this paper shows, are malleable as actors and political coalitions reconfigure them according to the changing context and their respective objectives.

Incumbents may take to different narratives, but the discursive constitution of a fuel encased in narratives is determined by the materialities of the resource [21]. The discursive constitution of a fuel is a social act, which is linked to the material qualities of the resource and the specific material relations that shaped its role in the past. Natural gas is an infrastructure-intensive source of energy that yields relatively low emissions upon combustion in comparison to other fossil fuels (e.g. coal) [21]. Consequently, incumbents are in control of a vast infrastructure network necessary to produce, transit, and distribute the fuel, while they also produce and trade a convenient source of energy that is deemed less harmful from a climate standpoint than most of its alternatives. Gustafson ([12]: 30) poetically illustrates this by writing that “[t]here is something appealing in its purity, its elegance of understatement. When it mates with oxygen it burns cleanly, with a bright blue flame, and then vanishes, leaving only water and carbon dioxide, the stuff of soda water. [...] Oil, by comparison, is a sludge of chains and hexagons that is largely useless until refined and sorted out, disciplined, so to speak. Coal is even worse. Natural gas is a princess”. Despite its appeal, it is a non-renewable emitting source of energy that leaks into the atmosphere throughout its supply chain, exacerbating climate change [2,5,50,51].

Gramsci's concept of hegemony allows for social change to unfold as a result of the power struggle between various social factions. When a dominant faction's power recedes, incumbents enter a period of *interregnum*: a state where the pre-existing order is destabilising but the new is not powerful enough to take its place [52]. Gramsci identified two common strategies political factions deploy in such social conflicts: *passive revolution* and *war of position*. The latter is a military metaphor when groups avoid initial futile confrontation with entrenched powers. Instead, they implement a long-term strategy coordinated across multiple bases of power to gradually establish their dominance. Levy and Egan ([53]: 807) succinctly define passive revolution as “a process of reformist change from above, which entailed extensive concessions by relatively weak hegemonic groups [...] in an effort to preserve the essential aspects of social structure”. Gramsci ([37]: 106) hypothesizes that this implies “1. that no social formation disappears as long as the productive forces which have developed within it still find room for further forward movement; 2. that a society does not set itself tasks for whose solution the necessary conditions have not already been incubated, etc.”. A passive revolution can thus be deployed by incumbents to maintain a social structure that favour their positions and allow for their continued activities, precisely this paper's object of study, where incumbency refers to actors within the EU's natural gas sector.

Gramsci suggested that a passive revolution can take one of two forms: *caesarism* and *trasformismo*. In the case of the former, a strong leader typically intervenes to resolve the stalemate of opposing social forces, while in the case of the latter a leader seeks to co-opt subaltern social groups, assimilating and subjugate their ideas to the dominant

coalition's policies. Caesarism has little relevance in the case of the energy transition, since there is no single solution to the climate issue, but it rather relies on a number of solutions. *Trasformismo* is more fitting to theorise the actions of the EU's natural gas industry, because incumbents will deploy "a combination of ideational, institutional and material sources of power serve to maintain the status quo and accommodate pressures for more far-reaching change", as noted by Newell ([35]: 28). This entails that actors associated with *the* (or *a*) dominant political faction draw on their three bases of power to sustain their relative dominance in a given setting. Drawing on their bases of power, they also seek to shape the actions of the state with outcomes encoded via policy, which, in-turn, reproduce relations of dominance [43,54].

### 3. Research design

This paper has two objectives: (1) to assess the response of the natural gas industry in the EU to climate action and (2) develop a better understanding of incumbents' bases of power. To achieve these, it explores EU climate and natural gas policy between 2009 and 2019. I selected this interval, because this is when the EU began to take more forceful climate action that had a tangible impact on its energy system [19,55]. While I primarily focused on the 2009–2019 interval, I found it necessary to explore the historical roots of certain dynamics, such as the origin of natural gas' transition fuel label.

I carried out discourse analysis when conducting the research that led to this paper. According to Laclau and Mouffe ([56]: 96) discourse is "an *articulatory practice* [italics in original] which constitutes and organizes social relations", which allowed me to trace changing social relations over time. I deploy critical discourse analysis to focus on the linguistic properties of texts and text-context dynamics [57,58]. The latter was informed by a number of sources, ranging from statistical databases [59–61] to studies and news articles, while the former was composed of various texts produced by stakeholders and interviews I conducted.

As a first step, I identified relevant stakeholders that produced texts pertinent to my analysis [62]. I focus on actors influential at the EU-level, including policy-making institutions, major upstream and midstream actors. I did not include the downstream natural gas segment, given its splintered nature [19]. Based on the literature, this included the European Commission (DG Energy and DG Climate Change), major natural gas suppliers (Gazprom and Equinor), EU-level sectoral lobbies (International Association of Oil and Gas Producers [IOGP], Eurogas, Gas Infrastructure Europe [GIE]), European Network of Transmission System Operators for Gas (ENTSOG), and non-governmental organisations (Greenpeace and Friends of the Earth). I chose not to thoroughly include the position of national governments, since this would have substantially expanded the scope of the project. I then assessed the policy papers, directives, position papers, reports, presentations, speeches, and strategy papers published by these actors between 2009 and 2019 that were of relevance to my research. I analysed approximately eighty documents.

The second pillar of my fieldwork included forty-two semi-structure interviews [63] I conducted between 2018 and 2020 with experts affiliated with the aforementioned stakeholders (see annex 1). After I gathered relevant documents and conducted the interviews, I undertook the analysis by exploring three interrelated processes as suggested by Janks ([64]: 329): (1) text analysis (i.e. the object analysis); (2) processing analysis (i.e. how it is produced and received); and (3) social analysis (i.e. the socio-historical conditions). In the transcribed interviews and selected documents, I searched for demi-regularities and recurring themes based on which I coded the texts. My focus was on identifying how these texts discussed natural gas' role in relation to climate measures and what role climate policy allocated to natural gas. By undertaking a processing analysis, I explored which actors produced the texts, how they framed natural gas, and, based on my theoretical framework, I then examined why they framed it in that specific manner.

I then triangulated the data I gathered, other primary sources (e.g. reports, studies, statistical data), and the academic literature to verify my findings.

## 4. Results: Natural gas alias the transition fuel

### 4.1. The origins of the transition fuel narrative and industry power

Gas has long been subject to favourable discursive framing on environmental grounds. This dates to town gas, natural gas' quasi-predecessor, which offered urban populations a tool to alleviate air pollution already during the 1800s [65]. The benefits of consuming town gas or natural gas instead of coal were later underscored by the British government during the Great Smog of London in the 1950s [66]. This line of argumentation was taken up by multiple states following the 1970s' oil crises, when environmental protection enjoyed political momentum and countries sought alternatives to oil imports [67]. These entrenched the idea that gas is the cleanest fossil fuel, given that it emits lower levels of particulate matter, sulphur dioxide, or nitrous oxides. Its relatively low CO<sub>2</sub> emissions upon combustion make it an ideal fuel from a climate standpoint as well [68,69].

Already in its First Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) indicated that consuming natural gas is preferable to other fossil fuels [70–72], leading it to support coal-to-gas switching on climate grounds. Flavin [73] also argued that natural gas was well-suited to provide a low carbon source of energy to meet society's demand as it shifted towards renewables. Subsequently published academic studies confirmed this proposition and posited that natural gas could become the *transition fuel* [74,75].

Transition fuel discourses shaped the role policy-makers envision for natural gas. A number of interviewees affiliated with the European Commission underscored that EU policy-makers had thought about natural gas as the transition fuel since the 1990s (COM\_1; COM\_2; COM\_3; COM\_4). One of them remarked that "natural gas has always had a bridge fuel role, because of its cleanliness" (COM\_3). This was reflected in EU reports [76] and policy as well. For instance, the Commission ([77]: 6) anticipated that "[a]dditional [greenhouse gas emission] reductions will result from switching from coal to natural gas as planned in several Member States" in preparation for the 1997 Conference of the Parties (COP) in Kyoto. Climate action was discussed as something that would strengthen the role of natural gas in the EU's energy mix, which may be the reason that related discussions are absent from publicly available corporate reports or statements. Policy-makers did not question the fuel's role in the energy system on climate grounds and thus private interests did not have to take action to defend their role. Climate policy at the time had limited "bite" (NO\_Ind\_1) on energy markets in general [55], but natural gas actors saw themselves as especially insulated from such intervention given the fuel's rising role in the EU.

In the 1990s, the UK and, later, the EU enabled natural gas to be consumed for power generation, which governments followed with the liberalisation of their respective markets [12,78,79]. Consumers turned to the fuel to meet rising energy needs, prompting a *dash for gas* which resulted in a coal-to-gas switch that also alleviated air pollution and reduced CO<sub>2</sub> emissions. An interviewee noted that the "drive for gas [was] because gas is cleaner, the whole idea that the gas industry sold to everyone it was available, it was acceptable" (UK\_A\_1). Acceptability and climate-compatibility supported its uptake, but competitiveness and availability were nonetheless the key drivers of demand [12]. Rising consumption was also coupled with the build-out of its transit and distribution infrastructure. Following the initial wave of infrastructure development during the 1970s and 1980s, the 1990s brought a flood of new projects that developed international connections to Norway, Algeria, and Russia as well as intra-EU pipelines [11,80,81]. These were accompanied with a rising number of liquified natural gas (LNG) import terminals, mostly in Western Europe [82]. The boom of infrastructural

developments and the widespread adoption of natural gas-based energy consumption practices in the 1990s enabled the fuel to play a prominent role in the EU's energy mix, establishing sectoral incumbents' bases of material and institutional powers.

#### 4.2. Strengthening incumbent positions, rising climate targets

Despite government concerns over security of supply [83], EU natural gas demand rapidly grew until 2005 [61]. The Great Recession and high oil prices reversed this expansion, which was exacerbated with its "image's impairment" (EU\_Ind\_3) following the 2006 and 2009 supply crises. The silver lining for the industry – which now supplied a quarter of EU energy [61] – was that the EU ramped up its climate policy ambitions. Most prominently, the Commission developed the EU Emission Trading System (EU ETS), which was poised to have a direct impact on energy consumption patterns by penalising more CO<sub>2</sub>-intensive fossil fuels [55,84-86]. Nine interviewees noted that the EU ETS was designed to support a coal-to-gas switch, even if it was unsuccessful in this objective [19,55,87]. The EU's approach to climate policy nonetheless led industry incumbents to assume that their fuel would be favoured throughout the transition – this was mentioned by twenty-five interviewees.

The EU may have aspired to lead global decarbonisation efforts, but it did not yet have the tools to execute such ambitions [88]. An interregnum unfolded in the late-2000s and early-2010s, when the Commission launched its 2020 Agenda. Some EU institutions and Member States began to support greater climate action [89,90] as warnings of climate change's impact amounted [91,92], but decarbonisation did not yet seem politically or technologically feasible. An industry expert noted that "2009 brought more coherent climate policies. Increasing pressure to decarbonise [became] critical part of EU energy policy" (EU\_Ex\_1), even if its affect was still limited.

The hint of change prompted the natural gas sector to underscore that its fuel was a necessary component of the energy transition. It responded by popularising the transition fuel narrative. Gastera ([93]: 6)—a Royal Dutch Shell, ExxonMobil, and Dutch government joint venture which trades natural gas—asserted that "natural gas is relatively benign to use, with the least impact on the environment" and envisioned a natural gas-intensive energy transition in its influential report. The Gas Advocacy Forum ([94]: 17–18) also suggested in its forward looking report that "by increasing utilisation of existing gas-fired plants (currently at just 60% in Europe) and by replacing old coal-fired plants with new gas-fired ones, Europe can move faster and more cheaply towards its CO<sub>2</sub> reduction targets" in addition to which natural gas would be a "good match with renewables". Incumbents expanded their power by framing their fuel as essential in the energy transition.

Authoritative research institutions also backed the transition fuel narrative, including the MIT Energy Initiative [95] and the IEA [96]. The latter's 2011 flagship report even heralded the *golden age of gas* and assumed that global natural gas markets would thrive; although, it was much more cautious regarding the prospects of the EU's natural gas market, where it saw less room for growth than in Asia. Stakeholders did not necessarily differentiate between the messages and their respective geographies, given the momentum the industry could gather through the positive framing of the fuel (COM\_2; HU\_Ind\_1). These narratives were reflected in the Commission's climate policy planning as well. An expert working on related matters noted that "there was that first 2050 document [Energy Roadmap 2050 [97]], I think we wrote it around 2010–2011, and in that it was asked – please take a look – whether gas is a bridge fuel?" (COM\_4). The Commission's [97] Roadmap affirmed that natural gas could be the transition fuel, even if it would subsequently try to "wish-wash this" (COM\_4). The latter would refer to toning down the fuel's transitional role after the Paris Agreement in 2015, a point which sections below will return to.

Roadmaps published by various institutions conveyed similar findings. The European Climate Foundation (ECF) ([98]: 13) suggested that

"[n]atural gas in particular plays a large and critical role through the transition", while Shell ([99]: 23) proposed that "natural gas will give the world an early opportunity to reduce overall CO<sub>2</sub> emissions from energy by displacing coal with gas. At the same time, a continued strong focus on energy efficiency and market based CO<sub>2</sub> pricing will keep demand growth in check". Shell, as an oil and natural gas company, has a clear interest to support a natural gas-intensive energy transition, but ECF [98] and Heaps et al. [100] – both commissioned by organisations that are considered more "environmentalist" – take a similar position. What is more, even the report developed by Greenpeace and EREC [101] – a notoriously anti-fossil fuel NGO and a renewable lobby, respectively – assumed that natural gas would substitute other fossil fuels through 2030 after which its relative role would decline. Thus, the general transition fuel narrative was reinforced by the sector, but it was also incorporated into policy and a general understanding of how an energy transition could be feasible.

#### 4.3. Expanding the transition fuel discourse

The EU's sentiment towards fossil fuels began to change in the 2010s. It implemented the 2020 Agenda and pursued COP commitments by developing 2050 decarbonisation plans and establishing interim emission reduction targets [97,102]. In parallel, Germany launched the *Energiewende* in 2011 [103], which would shape EU climate policy in two major ways: it provided political support for further climate action and supported the competitiveness of renewable energy technologies [104-107]. These measures contested the grey hegemonic project and supported its green variant [39], but natural gas incumbents still presumed that their outlooks were bright. Stern ([19]: 2) recalls that "[a]t every major gas conference (both in Europe and across the globe) in the 2010s, senior executives of energy companies continue to make speeches (usually to like-minded audiences) laying stress on the importance of gas in meeting carbon reduction targets, and how switching from coal-fired to gas-fired power generation, and using gas to back up intermittent renewable power generation are the quickest and most cost-effective way to reduce carbon emissions".

A number of interviewees were perplexed why the Commission continued to support natural gas on climate grounds, given the supply security risks linked to the EU's strong import reliance (HU\_An\_1; PL\_An\_2; COM\_4). A reason for this was that the Commission could not take a fuel-specific decisions in its climate policy (COM\_1) i.e. it could not address natural gas specifically, but had to take a technology neutral approach. This was embodied in the ETS as well, which supported a shift to natural gas on climate grounds, ignoring other considerations of the fuel's rising consumption (COM\_2; EU\_Ex\_1; EU\_Ind\_3; NO\_Ex\_1). Accordingly, the incumbents welcomed Commission endeavours to increase the stringency of the ETS to raise carbon prices [108,109]. Another Commission official hypothesised that "its [natural gas] penetration was too large and it was being expanded in some areas [sectors]" (COM\_4). Both of factors played crucial roles, since the ETS was a climate policy tool that supported switching to natural gas, while the EU relied on natural gas to meet 22% of its energy needs in 2009 [110]. As an outcome, the EU sustained its reliance on imported natural gas, even if the Commission introduced measures to subdue supply risks.

Natural gas incumbents continued to didactically recite that they would provide the transition fuel, which an EU policy-maker referred to as "effing boring" (COM\_4). Nonetheless, EU policy did not yet reflect changes in the role it would allocate to natural gas in the transition. The Commission ([111]: 11), for instance, continued to argue that "[g]as will be critical for the transformation of the energy system" and "might play an increasing role in the future". Natural gas industry actors launched further public relations campaigns [112], such as Statoil-turned-Equinor's "Fuelling the UK with The Telegraph and Statoil" op-ed campaign in 2012 [113].

A minor, albeit noticeable shift pertained to what stakeholders understood as a transition fuel (see annex 2). As the *Energiewende* brought

the diffusion of renewables, many asked “what the heck is a bridge fuel?” (COM\_4). The dominant narrative—that natural gas can substitute more polluting fossil fuels *en route* to a renewable society—was gradually complemented with an alternative interpretation by stakeholders: it provides an ideal pairing with renewables in the EU’s energy system. Natural gas-based electricity generation can be ramped up quickly to help meet demand when renewable energy-based output recedes. The transition fuel discourse came to rest on two pillars that carried equal weight according to interviewees. Consequently, actors of this “community of stakeholders” (UK\_Ex\_1) continued to assume that they were in a “comfort zone” (EU\_Ex\_1) and would have a secure role in the EU’s energy mix for years to come.

#### 4.4. Institutional power

The Commission was thoroughly involved with establishing a single competitive natural gas market alongside its focus on developing climate policy [15,89]. The Third Energy Package was formative in achieving providing the framework for a market, but it also institutionalised natural gas incumbents’ role in developing market regulations, codes, and guidelines [114]. Network codes, for instance, are proposed by the European Network of Transmission System Operators for Gas (ENTSOG), which is a supranational association of European transmission system operators (TSOs). After the Agency for the Cooperation of Energy Regulators (ACER) – an independent body of the European Commission – assess the codes proposed, their implementation is supported by the European Commission, but conducted by national energy regulators [115]. In this process, the “Commission is dependent on the expertise of ENTSOG” (EU\_Ex\_1) and “should provide technical guidance for the Commission and should not lobby, although in reality [it] is geared to develop the gas market” (COM\_1). Policy-makers oversee, revise, and contest proposals, even they have come to acknowledge that the power of ENTSOG is disproportionately large and carries a pro-natural gas bias – noted by policy-makers (COM\_2; COM\_5), NGOs (NGO\_1; NGO\_2), and other experts (EU\_Ex\_1; EU\_Ind\_3). Even an expert affiliated with ENTSOG acknowledged that the organisation had a “voice” in policy-making (EU\_Ex\_1). This was recently also underscored by the former Head of DG Energy as well, Klaus-Dieter Borchardt ([116]: n.p.), who remarked that “the position of the Entsos is too strong”.

European-level industry associations, especially those of infrastructure owners (e.g. ENTSOG or GIE), also play crucial agenda-setting and narrative-forming roles. This manifests through their role in developing EU-wide infrastructure and regulations [117]. ENTSOG plays a pivotal role in proposing the Ten Year Network Development Plan (TYNDP) on a biannual basis, which effectively comprises of the projects TSOs deem necessary to be developed and are politically supported by EU-level institutions and Member States. Projects of Common Interest are then selected from the TYNDP, but receive even greater political support and financing from the EU. By shaping the narrative on infrastructure needs on supply security and climate action grounds, incumbents influence the development of energy infrastructure, underpinning their material power. This is reflected in reports, studies [118,119], and industry positions [120] recently published, which support an energy transition that utilises existing natural gas infrastructure. Lastly, the sector by and large has invested extensively in lobbying and establishing the connections that would maintain the resource’s role in EU’s energy mix [121].

#### 4.5. Turning tides

Climate action brought an end to the natural gas industry’s “comfortable position”. Critical voices were mounting [122,123], especially due to the risks paired with methane emissions linked to the fuel’s production, transit, and distribution as well as the risks associated with its lock-in. Methane is a greenhouse gas 86-times more potent during a twenty year timespan than carbon-dioxide [124]. This led

Howarth [50] to poignantly conclude that natural gas is not a bridge fuel, but rather a “bridge to nowhere”. Natural gas stakeholders interviewed overwhelmingly identified the 2015 Paris Climate Agreement as the point when policy-makers began to question whether natural gas’ long-term outlook was as rosy as many had assumed (see annex 3). Paris offered a testament to more ambitious EU climate action [125]. Natural gas demand may have been rebounding from its post-economic crises lows, but this was on the back of economic recovery as opposed to the large-scale coal-to-gas switch that many industry insiders had anticipated [19]. The fuel’s perception was further weighed down by the continued risks associated with its supply security, as EU-Russia relations further deteriorated.

The industry came to understand that its future was increasingly contingent, which the European Commission [126] made clear through the orientation of its Clean Energy for all Europeans policy package. Maroš Šefčovič ([127]: n.p.) the Commission’s Vice-President for the Energy Union and EU Space Policy remarked that the objective of this Package was to “boost the clean energy transition”. It demonstrated that the EU’s energy future would rely on renewables and electrification. The Commission did not discuss the future role of natural gas, which sent a shockwave through the sector, as incumbents came to the realisation that the policy-makers may be pondering a gas-free future. The Clean Energy Package marked a shift in the Commission’s engagement with natural gas, when “instead of being part of the solution, [it] became the problem itself” (US\_Ind\_1). The Commission ([126]: 6) states in the Package that the EUR 6.6 billion of subsidies natural gas projects received in 2015 “from the legacy of historical investment subsidies, fossil fuel investment grants, feed in tariffs, fuel tax exemptions, electricity production, and decommissioning and waste disposal” would be phased out. Thus, the EU began to withdraw its financial support for natural gas projects.

Interviewees noted that failing to reflect on the role of natural gas in the Clean Energy Package was a “mistake” (EU\_Ex\_1). Even an EU policy-maker I interviewed saw it as a “missed opportunity” (COM\_5), since they saw that renewables would not offer a comprehensive solution for the energy transition – the interregnum continued. This was underscored by Eurelectric’s [128] – the electricity generators’ advocacy group – influential report stating that the EU would be unable to fully electrify due to technological and economic limitations. This would lead the Commission to develop a natural gas-focused energy package to complement the Clean Energy Package [129]. However, first, the Commission [130] took to addressing methane emissions, which was the most paramount problem given the large role the fuel already plays in the energy system. The Commission may have been forced to revisit the role of natural gas in the EU’s energy system, but the Clean Energy Package shifted the fuel’s discourse from the “cleanest” fossil fuel to “another” fossil fuel that policy-makers would have to phase out (EU\_Ind\_1; NGO\_1; NO\_An\_1; NO\_An\_2).

#### 4.6. The industry’s response

Incumbents had to respond to ensure the “survival” (COM\_4) of their sector, since their fundamental existence was challenged by the EU’s push to decarbonise. The preeminent platform where they shaped long-term strategy and policy was the yearly Madrid Gas Forum and, to a lesser extent, the Copenhagen Infrastructure Forum. The Madrid Forum had historically been an event the Commission convened to discuss network codes and technical regulations governing the EU’s natural gas market. However, debates began to shift around 2017 to tackle the challenge of decarbonisation and natural gas’ role in it [131,132]. These discussions took place with the involvement of policy-makers, experts affiliated with incumbents, and a limited number of academics, while NGOs were excluded from the proverbial table (EU\_Ex\_1; NGO\_Ex\_1). Their exclusion is problematic, because NGOs had begun to pay more attention to natural gas [121,133] and contest its role in the EU’s energy mix at the time (NGO\_1; NGO\_2; EU\_Ex\_1; EU\_Ex\_5; COM\_1).

Presentations by the European Commission, Eurogas, European Federation of Local Energy Companies (CEDEC), Gas for Climate, and ENTSOG all emphasised the need for gas in the EU's decarbonised energy future [131,132], reinforcing the transition fuel narrative.

Presentations also began to explore the role renewable or decarbonised gases could play in meeting energy demand [134,135]. This had already been introduced into discussions, with the publication of 'The role of Trans-European gas infrastructure in the light of the 2050 decarbonisation targets' report, emphasising how the availability of infrastructure warranted the inclusion of gas in the energy transition [119]. The inquiry continued when the Commission requested "a few assessments by researchers [...] which reflected this new thinking" (COM\_6) at the 2019 Madrid Forum. Most of the reports were conducted or supported by industry associations. For example, the International Association of Oil & Gas Producers (IOGP) was tasked to explore carbon capture and storage (CCS), the infrastructure lobby group Gas Infrastructure Europe (GIE) focused on methane emissions, and ENTSOG was requested to cooperate with European Network of Transmission System Operators (ENTSOE) and explore how the gas and electricity grid can be integrated (COM\_6; EU\_Ex\_1) [136].

The common external threat posed by climate action converged the interests of what had been a "community of stakeholders" (UK\_Ex\_1) to argue a relatively unified position that they were willing and able to decarbonise their fuel. This external shock was the basis of them forming a coalition that was united around a common goal to maintain the role of the fuel in the long-term. The TSOs were the first to introduce a strategy (EU\_Ex\_1; EU\_Ex\_4; UK\_Ex\_1; UK\_A\_1) in which they argued that the EU's vast gas pipeline system offered an efficient mode to transit energy and would underpin an efficient transition. TSOs emphasised that they would be able to transit low carbon gases (e.g. biomethane) and decarbonised gases (e.g. hydrogen) instead of emitting natural gas to help meet energy demand. They drew on their infrastructure – a material base of power – and argued that the EU should pursue a gas-based transition [137-140].

Producers pledged to develop technologies that allowed for the decarbonisation of natural gas [18], alongside their continued support for the transition fuel narrative. For instance, Statoil-turned-Equinor claimed that a greater role for natural gas in the EU's energy mix is a testament to its climate commitments [141]. More importantly, producers also began to co-opt the long-standing utopia of a society reliant on emission free hydrogen [142]. Hydrogen offers a convenient, non-emitting energy carrier that functions similarly to natural gas in many senses: it is gaseous, convenient fuel that can be used for similar applications and energy storage. A rising portion of society, experts, and policy-makers, such as van Hulst ([143]: n.p.) discussed hydrogen as the silver bullet or the "missing link" of the energy transition.

Hydrogen can, however, be produced from multiple sources. Currently, it is mostly produced by oil and gas corporations as well as ammonia producers by steam reforming methane, which overwhelmingly originates from natural gas [144,145]. This yields CO<sub>2</sub> emissions and is referred to as grey hydrogen. If hydrogen is produced from methane, but does not yield CO<sub>2</sub> emissions, it is called blue hydrogen. The issue of methane emissions throughout the natural gas supply chains persists in both cases. Equinor is experimenting with pairing steam methane reforming with CCS [146,147]. Accordingly, it leads multiple hydrogen projects in Europe (e.g. H21, H-vision, Magnum, and the Net Zero UK partnership). Gazprom has turned to methane pyrolysis, which allows it to produce hydrogen without combusting methane [148] – this allows it to forego the problem of storing CO<sub>2</sub>. Both of these major suppliers argue that the hydrogen they will provide will be a key component of the EU's energy transition [141,148-151]. This approach has already been included into policy as well [152].

According to the Commission's Hydrogen Strategy [152], grey and blue hydrogen are both permissible, if methane emissions are kept in check, and until the panacea of hydrogen – green hydrogen – is developed and sufficiently scaled. Green hydrogen is the electrolyses of water

from renewable-based electricity. This is what underpins the excitement around the fuel, since many presume that renewable-based hydrogen can offer a sustainable source of energy. Even though green hydrogen and other sustainable gases face capacity limitations and their scaling has been slow to unfold [153,154]. Moreover, scaling renewables to produce vast quantities of renewable energy to meet hydrogen demand may have other negative environmental ramifications [154-156]. The general support for green hydrogen has allowed the natural gas industry to capture the momentum and carve out a role for methane-based hydrogen. Infrastructure-owners also tend to be supportive of hydrogen [157], irrespective of how it is produced and the questions of whether natural gas infrastructure is fit to transit and distribute hydrogen [158,159] since it extends the high utilisation rates of their infrastructure.

Thus, natural gas' discourse is shifting once again: it is now not only a transition fuel, but also an *end fuel* [112]. Consumers can rely on it indefinitely, since blue hydrogen is effectively accepted as climate compatible, despite many lingering questions pertaining to its emission-intensity [160]. The prominence of the matter was underscored during my semi-structured interviews, when I posed questions about natural gas, but many interviews ultimately ended up as discussions about hydrogen (EU\_Ex\_2; EU\_Ind\_1; EU\_Ind\_3; EU\_Ex\_4; EU\_Ind\_4; COM\_6). The narrative has shifted, natural gas is not only the transition fuel, but by converting it to hydrogen, it can become an end fuel.

## 5. Discussion: Discourse is a powerful tool of incumbents

Natural gas incumbents' power has relied on the narrative that natural gas is a transition fuel, their role in policy-making and meeting energy demand, as well as their control over a vast infrastructure network. These constitute three bases of power: discursive, organisational, and material, respectively. These bases of power were established with the fuel's uptake, which accelerated during the 1990s and 2000s. During this period, the sector – composed of a loosely-knit community of competing stakeholders – and governments supported the broad adoption of the fuel. Producers increased supply, while transmission and distribution system operators expanded infrastructure. These would be the bases of the industry's material power. In addition, the fuel's physical qualities ensured its environment- and climate-compatibility. This material consideration underpinned a discourse that natural gas is a climate friendly source of energy and thereby preferable to other fossil fuels.

The discourse positioning natural gas as the transition fuel emerged in the 1990s, but was enhanced in the 2000s and 2010s by policy-makers, research institutions, and incumbents. This was based on it being the least carbon intensive fossil fuel that can help the EU meet its climate goals, if it substitutes coal, for instance. As an interviewee succinctly noted: "[n]atural gas as a transition fuel shares multiple similarities with other 'greenwashed' environmental discourses [...] It too originated from an academic institution, which has been a frequent phenomenon, but it has been pushed by powerful actors along the way" (US\_A\_1). The transition fuel discourse originated from researchers and it was popularised through its inclusion into various influential reports, including the IPCC reports. This alleviated policy-makers from having to thoroughly consider the environmental and climate implications of its uptake. Incumbents did not have to take particular action, since there were no impediments to the fuel's rising consumption – supply security could be considered as such an impediment, but concerns were generally brushed to the side.

Incumbents began to respond to rising climate ambitions in the 2010s in a sporadic manner that was directed at fortifying the existing transition fuel discourse. They presumed that natural gas would play an integral role in the shift from the grey to the green historical project – it would be essential in both, given the interregnum that unfolded due to the technological, economic, and political barriers of a quick transition. Policy-makers focused on energy security and the development of a

single competitive market at the time, both of which underpinned the material and institutional power of incumbents. The Commission supported infrastructure development and institutionalised a system of governance in which incumbents played a central role.

The rise of renewables prompted incumbents to reposition the role of natural gas in the energy mix. They emphasised that their fuel could complement the intermittency of renewables to which end the market framework and infrastructure grid was already available. This marked a shift in the understanding of a transition fuel. It would not only be an intermediary step in the energy transition and the shift from the grey to the green hegemonic bloc this entailed. Instead, incumbents reframed natural gas as a complementary source of energy to renewables, they led a *trasformismo* to coopt the emerging force of change. They presumed that this would allow for the perpetuation of their dominance in the EU's energy system, as these positions surfaced in both expert positions and policy, given the unresolved challenges of the transition.

The Paris Climate Agreement and the Clean Energy Package brought yet another turn in natural gas' discourse. With these commitments, the Commission – backed by Member States – signalled that it would up its climate targets. This prompted policy-makers to question what role natural gas can play in the EU's energy mix, dislodging the firmly grounded transition fuel discourse: it suddenly became another problem that policy-makers would have to tackle as opposed to being a part of the solution. The materialisation of this discursive shift will take time – natural gas demand continues to grow [61] – but it signalled a change in policy: it could not be consumed indefinitely in its emitting form. The shift was also supported by the supply security risks that the sustained reliance on the fuel entail. Incumbents were surprised by the abrupt shift, since they had not developed strategies on how their fuel would be used in a carbon neutral setting. This also shows, that discourses perpetuated by incumbents can limit their ability to anticipate change.

The threat prompted natural gas incumbents to draw upon all their bases of power to shape the direction of the EU's energy transition. They backed pre-existing transition fuel narratives, leveraged their control of a vast cross-continental infrastructure and the entrenchment of energy consumption practices, as well as their role in shaping EU policy. They launched a *trasformismo* to reposition their fuel in the changing context. Producers' objective was to ensure demand for methane, while transmission system operators supported that substantial volumes of gas play a role in a decarbonised energy mix. Incumbent interests converged and, given the shared threat, the answers they proposed were quite similar. Blue hydrogen offers a solution to a number of problems that emerged, while it allows for the extension of the status quo. It ensures that producers can continue the exploitation of their methane resources, infrastructure owners can continue to transit and distribute large quantities of gas, and it enables policy-makers a tool to overcome the interregnum stemming from the limitations of electrification. Incumbents led a discursive shift that not only adjusted how natural gas is framed – end fuel as opposed to a transition fuel – but also introduced a narrative where gas was a part of both the energy transition and a future low

carbon energy system.

## 6. Conclusions

I developed this paper for two reasons. First, I was curious of the natural gas industry's response to climate change. By tracing pertinent discourse, this paper suggests that natural gas consumption and climate action were understood to be compatible. If anything, many presumed that the latter would support demand for the fuel and expand the influence of its industry. Only more ambitious, stringent, and long-term climate targets could dislodge incumbents from their comfort zone. This prompted the sector to explore how it could play a role in the transition and a low carbon energy system – blue hydrogen is the answer incumbents have proposed. Second, this paper set out to develop a better understanding of incumbents' bases of power. It shows how they draw on material, organisational, and discursive power to shape the EU's energy transition. Surveying the past decade allows one to see how incumbents' control over infrastructure, place in policy-making, and role in shaping discourses has allowed them to influence the role natural gas plays in the energy transition. All these forms of power have been essential in shaping the fuel's role, but the influence of discourse has especially come to the fore as incumbents had to insert their fuel into a narrative of the energy transition that is still being discussed and unfolding along ideas proposed.

The case of natural gas sectoral incumbents' role in shaping discourses shows how crucial this is in the energy transition's trajectory. While social movements, civil society, politicians, policy-makers, renewable energy firms, and a number of other actors may push for change, incumbents have an ability to sway the perception of their fuel. Narratives are essential in reconciling the exploitation of fossil fuels and a low carbon future. This is of especially large importance as the energy transition has only just begun to unfold. Its outcomes are still malleable, allowing for incumbents of various sectors to (attempt to) reposition themselves and establish their relevance in the green historical bloc.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Annexes

### Annex 1

#### Interviews

Code	Position/description	First interview
COM_1	European Commission expert involved with developing the single market	22-Jan-19
COM_2	European Commission expert involved with natural gas affairs and methane emissions	22-Jan-19
COM_3	European Commission infrastructure expert	23-Jan-19
COM_4	Former European Commission expert working on the single market and natural gas affairs	29-Aug-19
COM_5	European Commission natural gas and carbon-dioxide infrastructure expert	11-Jan-19
COM_6	Senior expert on natural gas codes at ACER	11-Jan-19
EU_Ex_1	Senior expert from natural gas infrastructure industry group	22-Jan-19
EU_Ex_2	Executive from natural gas infrastructure advocacy group	22-Jan-19
EU_Ex_3	Executive of advocacy group focused on gaseous energy carriers	25-Jan-19

(continued on next page)

## Annex 1 (continued)

Code	Position/description	First interview
EU_Ex_4	Senior expert from natural gas industry advocacy group	25-Jan-19
EU_Ex_5	Expert from industry advocacy association	27-Jan-19
EU_Ind_1	Senior executive affiliated with major EU natural gas supplier	22-Jan-19
EU_Ind_2	Policy expert affiliated with major EU natural gas supplier	22-Jan-19
EU_Ind_3	Senior executive from major EU natural gas supplier's Brussels office	24-Jan-19
EU_Ind_4	Industry source from major EU natural gas supplier's Berlin office	26-Jul-19
Ind_1	Head of energy trading and analyst company	27-Jul-19
NGO_Ex_1	Energy expert working at a Brussels-based NGO	25-Jan-19
NGO_Ex_2	Energy expert working at a Brussels-based expert from NGO	24-Jan-19
G_Ex_1	Senior expert at a global energy research institute	28-Jan-19
G_Ex_2	Natural gas market analyst at a global energy research institute	28-Jan-19
D_Gov_1	German energy diplomat	26-Jul-19
D_Gov_2	German energy diplomat	26-Jul-19
D_A_1	Berlin-based academic focused on natural gas affairs	31-Jul-18
HU_Ind_1	CEO of a Hungarian natural gas infrastructure firm	03-Jul-19
HU_Ind_2	Senior expert from a Hungarian stakeholder involved in the natural gas and electricity sectors	22-Jul-19
HU_An_1	Natural gas market analyst from Hungary	12-Jul-19
PL_Gov_1	Senior Polish government official in the Ministry of Energy	15-Jan-19
PL_An_1	Natural gas market analyst from Poland	15-Jan-19
PL_An_2	Natural gas market analyst from Poland	17-Jan-19
PL_Ind_1	Senior expert at natural gas firm and former energy affairs attaché in Brussels	15-Jan-19
PL_Ind_2	Industry source from Polish utility	17-Jan-19
NO_A_1	Academic based in Norway	13-Mar-19
NO_Ind_1	Senior executive of biogas firm	18-Mar-19
NO_An_1	Energy analyst from Norway focused on international energy governance and producer-consumer relations	18-Mar-19
NO_An_2	Energy analyst from Norway focused on EU-Russia relations	19-Mar-19
NO_An_3	Energy analyst from Norway focused on Gazprom	23-Mar-19
G_Fi_1	Industry source from global financial player	26-Sep-19
US_A_1	Academic based in the USA, who has published on the environmental governance of the EU	24-Sep-19
US_A_2	Academic in the USA focused on Russia-EU relations and Russia's energy strategies	24-Sep-19
US_Ind_1	Senior executive of US LNG company	03-Sep-19
UK_A_1	Senior expert at an energy think tank in the UK	13-Aug-20
UK_Ex_1	Scholar at a UK university working on energy affairs	03-Sep-20

## Annex 2

## The concept of a transition fuel

**Bridge the gap between more polluting fossil fuels and renewables**

"Switching coal for nat[ural] gas is already a step [...] its transition fuel role holds up in this sense" (EU\_Ex\_1)

"Gas is a part of the solution, transition" (EU\_Ex\_2)

"Nat[ural] gas has always had a bridge fuel role, because of its cleanliness" (COM\_3)

"large-scale decarbonisation is taking place through a switch from coal to natural gas [underpinning its transition fuel role]" (EU\_Ind\_3)

"There was and still is a recognition that natural gas is a cleaner energy source than coal, and that a switch from coal to gas is beneficial in the power production sector from a CO2 reduction perspective" (EU\_Ex\_5)

"They [Russians] constantly find positive aspects of gas and shamelessly the point to the climate benefits [...] they believe that gas has a great future" (NO\_An\_2).

"and somebody in the audience from the company kept coming out with this like: 'Look, all you need to do is shut down all the coal, replace it with gas and you'll [meet climate targets]'" (UK\_Ex\_1)

"Gas was a cleaner alternative to coal and oil [was recited as a] mantra" (HU\_Ind\_1)

"there is a lot that can be done than simply replacing coal with natural gas" (UK\_A\_1)

"switch from coal to gas, get as much renewables in the grid as you can and back it up with gas" (UK\_Ex\_1)

**Complement to renewables**

"but a bigger role can be expected [for natural gas], since it works well with renewables" (PL\_An\_2)

"natural gas should be seen as a complement to renewables" (PL\_Ind\_1)

"Renewables and nat[ural] gas a good alliance" (PL\_Ind\_2)

"Gas seen as the best backup of complimentary for renewables" (PL\_Gov\_1)

"intermittency is still not overcome [...] backup needed" (EU\_Ex\_4)

"Opinions range on a wide spectrum, one end of the scale emphasises the strong need for gas backup, and it is a very common opinion that gas is an ideal backup for renewables. At the other end of the scale there are those who say that the electric system [...] can substitute gas power plants. [Our institution] takes a position between the two. [...] We think that gas capacity utilisation rates will decrease [...] but will continue to play a key role in approximately 1000 hours per year [...] to balance the grid" (G\_Ex\_1).

"Gas plus renewables could work [...] since the EU backed renewables, it implicitly provided backwind for natural gas" (HU\_An\_1)

"but what an amazing complement this is to intermittent renewables and this is the winning combination" (COM\_4)

"The buildup, the rapid expansion of renewable power generations certainly in the UK, is a road to gas demand. I mean the gas is now relegated to playing a backup role." (UK\_A\_1)  
 "gas people said that gas will always be needed when the temperature hits lows, because that is when the gas infrastructure can provide a solution. Then, these electricity people [said] that the wind will stop and there won't be renewable energy, thus there will be a bunch of problems, we'll need gas backups to provide heating and for us to be able to operate" (COM\_6)



## Annex 3

EU climate policy's turning point from the natural gas industry's perspective.

Turning point for EU climate policy		
Prior to COP21	COP21	After COP21
"I think this [change] was continuous. I don't think there is a single policy package" (US_Ind_1)	"COP21 [provided] push: 2°C need to be reached according to member states" (EU_Ex_4)	"COP21: not shifted the official view of nat[ural] gas. 1.5°C report could produce push" (NGO_1)
"COP21 has had little impact on their practices...Russia is not a signatory. The deal itself has broad-ranging implications, but Gazprom was also working on related process of decarbonisation, hence the little impact on their positions" (EU_Ind_3)	"COP21 was a pivotal moment for the [natural gas] industry [...] COP21 driving decarbonisation and those decision-makers that came to the agreement are the key drivers of actions taken" (EU_Ex_2)	
"COP21: made the journey we were on very visible. Has not fundamentally altered our course of action, because most EU companies and states were already leaders in climate change combat" (EU_Ind_1)	"COP21 lent credibility to the climate agenda" (EU_Ex_3) "the Paris [Agreement] and most recently the IPCC 1.5°C was very successful in the sense that it redefined the rules of the game" (G_Ex_1) "I think [change came] around Paris" (COM_4) "Paris Agreement provided backing for renewable" (HU_Ind_2) "Climate policy has re-asserted its focal role again in the past 5 years [i.e. around 2014–2015]" (COM_2) "Paris was a key driver [...] furthered by commitments in Katowice. COP21's targets were highly indicative that change needs to be enacted" (EU_Ex_1)	

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## Update

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### Corrigendum

## Corrigendum to “Energy transition or transformation? Power and politics in the European natural gas industry's *trasformismo*” [Energy Research & Social Science volume 84 (2022)]



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1117 Budapest, Hungary was left off of the initial publication.

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