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Preparing the playing field: climate club governance of the G20, Climate and Clean Air Coalition, and Under2 Coalition

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Abstract
International climate policy is increasingly shaped by alternative forms of governance. Coalitions of national, subnational, and/or non-state actors have the potential to address the global challenge of climate change beyond the United Nations Framework Convention on Climate Change (UNFCCC) process. While initially such "clubs" spurred hope that they could be an option to achieve climate action more effectively than the UNFCCC, more recently, their role has been seen as preparing and orchestrating climate policy. In spite of its conceptual proliferation, literature on climate clubs stops short in examining practical evidence and conducting analyses beyond categorization and labelling of climate clubs. This article aims at contributing to filling this gap with a comparative perspective on three specific governance initiatives that act on different governance levels: the G20, the Climate and Clean Air Coalition (CCAC), and the Under2 Coalition. What contribution do these club-like initiatives make to global climate governance and how does it relate to existing structures such as the Paris Agreement and the UNFCCC process? Our paper applies central aspects of clubs research, namely, *membership*, *public goods*, and the *provision of additional benefits* as an analytical framework to examine the three cases. We find that these club initiatives, though highly diverse in their origin and membership, make a similar contribution to international climate governance. Their largest contribution lies in preparing emissions reductions through raising awareness, orchestrating different actors and actions, and establishing a large cooperation network. They complement the UNFCCC and especially the Paris Agreement.

Keywords International climate policy · Climate governance · Climate clubs · Minilateral policy approaches · Case study

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1 Introduction

The development of the international climate policy landscape over the first two decades of the twenty-first century leads to two observations: First, efforts and actors in global climate governance have increased and diversified. All governmental levels, but also diverse inter- and non-governmental actors and transnational alliances play a role. Many non-traditional climate policy actors have also taken up climate change as a major topic. For example, the G20 and G7 have included climate change on their agenda. Second, notwithstanding, the realized and promised actions to mitigate climate change are far from being sufficient. The process of the Paris Agreement (PA) under the United Nations Framework Convention on Climate Change (UNFCCC), adopted in 2015, faces major shortcomings. Signatories have committed to national efforts to combat climate change in "Nationally Determined Contributions" (NDCs) and jointly set a goal of keeping global warming at "well below 2 °C." Despite a multitude of new initiatives, policies, and regulations, the United Nations Environment Programme's (UNEP) latest stocktaking still expects NDCs to lead to a temperature increase of at least 3 °C by the end of this century (UNEP 2020).

A growing body of research has evolved that studies the diverse climate policy landscape. One approach to examine innovative governance initiatives is the "climate clubs" concept. A discussion has been led around the question of whether such "clubs" could achieve climate action quicker and more effectively than the UNFCCC, or whether they function more as building blocks that support the planning and implementation of emissions reductions and coordinate climate governance actions (Falkner et al. 2010; Stewart et al. 2017). While the literature often uses the term "(climate) clubs" as a label for an innovative type of climate governance actor and studies clubs' ability to generate benefits, previous research rarely explores the nature of their governance contribution. The few existing studies of concrete cases of climate clubs examine them from a meta-perspective (Weischer et al. 2012; Obergassel et al. 2020). Research lacks in-depth qualitative case study analyses of existing clubs. Further, the club concept has rarely been utilized as an analytical category for existing initiatives.

This paper takes the so far unexploited opportunity to look at existing climate governance initiatives from a comparative perspective and utilize the gained insights to explore the usefulness of the club concept. We use an analytical approach developed in Unger et al. (2020) as a basis for a comparative view of three heterogenous cases: the G20, the Climate and Clean Air Coalition (CCAC), and the Under2 Coalition (U2C). The paper starts with a glimpse at the development of the climate governance landscape and reflects on research on innovative climate governance initiatives such as climate clubs. Building on the literature on climate clubs, we examine the characteristics of the selected club initiatives in terms of their *membership* and *the public goods* as well as *the additional benefits or club goods* they provide. We discuss the results from a comparative perspective.

The paper seeks to answer the questions: What contribution do such club-like initiatives make in the global climate governance landscape, and what is their value for the global efforts to mitigate climate change under the PA? It contributes to gaining a more practical, case study-based knowledge on climate clubs and substantiates the nature of the clubs' contribution. Rather novel knowledge is gained by looking at CCAC and U2C, which, contrary to the G20, lack substantial academic investigation. In the starting year of the PA, with global climate efforts insufficient to keep warming "well below 2 °C," this paper can be a timely addition to research that evaluates innovative governance initiatives and how they help to achieve the

PA's targets. The practical findings of the examined case studies can feed into the theoretical discussions on climate clubs.

2 Setting the scene: innovative governance initiatives and climate clubs

The development of the multifaceted climate governance landscape cannot be understood fully without having a look at its central governing process under the UNFCCC. The failed Copenhagen conference in 2009 (Conference of the Parties (COP) 15) received much scientific attention, as it ended without an agreement to succeed the Kyoto Protocol. It led to what scholars called a "gridlock" in international negotiations (Victor and Keohane 2010). While this situation, on the one hand, led to frustration with the multilateral process, it has also initiated a diversification of policy efforts: Climate governance activities have diversified and especially those activities that do not have a strict legal character, such as climate strategies, plans, and non-binding climate programs and mechanisms, have increased. Within this realm, the number of actors active in climate governance has also multiplied and diversified. Climate governance has become transnational (Abbott 2012; Chan et al. 2018): Actors range from local to international governmental authorities and civil society groups, to the private sector. A highly complex and polycentric, but also fragmented international climate policy regime has evolved (Victor and Keohane 2010; Ostrom 2010; Pattberg and Widerberg 2017; Biermann et al. 2009). It has multiple governing units with considerable independence operating at different scales, which complement, but do not replace centralized global decision-making (Ostrom 2010). Scholars interested in polycentric governance often study how rather innovative forms of governance produce alternate ways of cooperation as well as climate and environmental benefits beyond global emissions reductions (Ostrom 2010).

Studying new and innovative bottom-up climate governance initiatives, such as climate clubs, thus helps to explore the evolving global climate policy landscape. As most of these initiatives start out as a smaller group, most research builds on the assumption that they can somehow make more effective or quicker progress in international climate policy because they have less bargaining complexity and can be more ambitious than large fora such as the UNFCCC (Buchanan 1965; Victor and Keohane 2010; Victor 2015). From an economics perspective, Buchanan (1965) describes clubs as a special form of cooperation, producing private and public goods. The concept has been applied to trade, environment, and climate-related issue areas (Prakash and Potoski 2007).

Climate clubs or clubs that treat climate change issues are usually seen in some relationship with the UNFCCC process. Initially, the discussion evolved around whether clubs have a complementing, bypassing, or conflicting relationship with the UNFCCC (Widerberg and Stenson 2013). However, more recently, research has tended to recognize clubs as a "friendly competitor" (Victor 2015: 8) that has a complementing and cooperative relationship (Widerberg and Stenson 2013).

From a conceptual perspective, many climate club approaches are rooted in the idea of forming a "coalition of the willing" (Hale 2011), referring to a group of like-minded actors cooperating on a specific topic. Approaches on clubs have in common that they assume that a small group of relevant players can develop solutions on a global level (Falkner 2016; Nordhaus 2015). In this sense, Hovi et al. (2017) define a climate club as "(…) any international actor (country) group that (1) starts with fewer members than the UNFCCC has and (2) aims to cooperate on climate change mitigation" (Hovi et al. 2017:2). Nordhaus

adds that "[a] club is a voluntary group deriving mutual benefits from sharing the costs of producing an activity that has public-good characteristics" (Nordhaus 2015: 1340).

Scholars have led a discussion on what exactly counts as a climate club and what potential climate clubs have. Some authors have hopes that through clubs, countries can overcome free-riding because laggards can be penalized or excluded and that clubs can even build alternate structures to the UNFCCC (Nordhaus 2020). Other scholars distinguish between classic (economic) clubs and pseudo clubs (Stewart et al. 2017). Pseudo clubs are looser coalitions, which produce benefits that are often reputational and less quantifiable and whose utility lies in coordination and technical expertise (Green 2017). Prakash and Potoski (2007) speak of variations of voluntary clubs that can have stringent, but also rather lax rules and objectives.

In parallel to these discussions on climate clubs, another strand of research with a broader focus has evolved. After the adoption of the PA in 2015, scholars started to examine how innovative transnational and non-state governance initiatives complement the UNFCCC process, for example, in closing the gap between national commitments and overall targets of the PA (Graichen et al. 2016; Hermwille 2018; Chan et al. 2018; Michaelowa and Michaelowa 2017). Several studies describe the potential of "orchestration" in this context: This refers to a situation where the UNFCCC or other inter- and transnational actors coordinate, initiate, direct, or manage policy efforts and actors in a rather soft manner (Abbott et al. 2015; Hermwille 2018; Chan et al. 2018).

Several studies bring together clubs thinking with research on the role of innovative climate governance initiatives for the PA. They suggest, for example, that climate clubs can support the implementation process of the PA (Stua 2017). Stewart et al. (2017) argue that different governance innovations can progress the implementation of the PA, framing a "building blocks approach": Multiple transnational mechanisms that include different sectors, themes, or measures related to climate change form blocks as part of a larger strategy. The building blocks have the potential to broaden the efforts countries committed to under the UNFCCC. Among the types of collaborations, Stewart et al. (2017) describe in their building blocks concept are climate clubs. These climate clubs, accordingly, need not be primarily concerned with climate issues, but subgroups of actors within an organization may support mitigation activities and link them to existing targets of the organization in a so-called linking strategy (Stewart et al. 2017). Stewart et al. (2017) further suggest that clubs can incentivize additional emissions reductions to those promised under the UNFCCC by shifting the incentive structure towards non-climate benefits, for example, reduced energy costs. This complements Victor's (2015) idea that clubs develop solutions to difficult or "niche" topics and help these solutions to be used by a larger array of actors. Last but not least, sending signals and guidance is regarded as the main governance task for clubs by some scholars (Obergassel et al. 2020). Clubs as building blocks help to implement and increase the effectiveness of the PA and may support the increase of ambition in future updates of commitments (Stewart et al. 2017).

3 Methodological approach

3.1 Analytical framework

This paper follows a broad understanding of climate clubs, as proposed by Stewart et al. (2017) or Prakash and Potoski (2007), as this allows for the analysis of a great variety of initiatives that tackle climate issues either as a central focus or as just one aim among others.

Clubs are, accordingly, a continuum of club-like arrangements, ranging from classic economic clubs to looser forms of coalitions (Stewart et al. 2017). This can include initiatives with highly stringent objectives and strong enforcement mechanisms as well as those with lenient standards and weak control (Prakash and Potoski 2007). For the practical analysis, this paper applies the framework of Unger et al. (2020), which extracts the main arguments from existing research on innovative climate governance actors and climate clubs. It examines clubs according to the following three criteria: (1) *club membership and size*, (2) *public goods*, and (3) *additional benefits or club goods* (Unger et al. 2020).

(1) *Club membership and size*: In order to advance climate change mitigation efforts, a club should have "relevant members." Most literature agrees that a club must include the "right" or "key" actors (Victor 2015; Falkner 2016; Hovi et al. 2017) and is exclusive to non-members (Nordhaus 2015). Relevance is usually determined based on the problem and is therefore rooted in the notion of a "critical mass" for a problem-solving activity. In this sense, members can be relevant in terms of greenhouse gas emissions (GHG) emissions (Naím 2009; Hovi et al. 2017) but also through their vulnerability to climate change or their capability from an economic, political, or knowledge perspective. Further, non-state members and transnational governance actors (Bulkeley et al. 2014) can increase relevance in terms of knowledge capacity and the potential for action on emissions reductions (Hale 2011). Authors' positions differ on what would be a good size for a club, ranging from small one-digit numbers to begin the club (Hovi et al. 2017), approximately 20 (Naím 2009) to no specific number (Stewart et al. 2017; Prakash and Potoski 2007). This paper takes the following aspects as indicators for relevant membership and size of a club: (a) *capability and problem-solving capacity*: e.g., share of the world's GHG emissions or economic capacity; (b) *legitimacy*: inclusion of responsible and affected actors; and (c) *a common objective* of tackling climate change mitigation.

(2) *Public goods:* The production of a public good or positive social externalities, namely, governance activities to mitigate climate change, is seen as the main objective of a climate club (Prakash and Potoski 2007; Green 2017; Hovi et al. 2017). For example, clubs can actively engage in emissions reductions by carrying out climate protection projects and on-the-ground activities. They support policy making by establishing an institutional mechanism to provide GHG reductions (Potoski 2017), such as reduction commitments or otherwise supporting countries in designing domestic regulations and mechanisms. Clubs can also enhance cooperation. They create opportunities for dialogue and bargaining by providing informal discussion arenas. They facilitate informal cooperation (Falkner 2016). Moreover, they create "a playing field" where cooperation is tested informally, and which can lead to deeper cooperation (Hovi et al. 2017). This paper takes the following aspects as indicators for the creation of public goods: (a) *active reductions of emissions*; (b) *support of policy planning*: development of policies and tools that advance climate mitigation among the members; (c) *advancement of political dialogue*: strategically oriented activities that raise awareness and increase support for the topic, such as international dialogues and high-level meetings; and (d) *enhancement of cooperation*: regular exchange and coordinated work on a specific topic.

(3) *Additional benefits or club goods*: A climate club should generate benefits or "club goods" for its members that are additional to the common goal of climate governance (Green 2017). Such benefits are incentives for potential members to join and keep them from dropping out (Hale 2011; Nordhaus 2015; Hovi et al. 2017). While these goods first

and foremost benefit members, they do not have to be entirely exclusive (Hannam et al. 2017). As Falkner (2016) rightly points out, the mitigation of climate change can never be a private good. We examine whether a climate governance initiative provides benefits that are additional to the generated public good and whether they see these as a reason for joining or staying in the club. Prakash and Potoski (2007) have suggested measuring these benefits against what would have (not) been produced in the absence of the club. The paper considers the following categories of additional benefits: (a) *financial incentives*: members gain financial advantages; (b) *knowledge incentives and methodologies*: e.g., the dissemination of energy efficiency or renewable energy technologies (Potoski 2017) or access to the club's knowledge products and expertise; (c) *reputational benefits*: being a member brings prestige and recognition by stakeholders, and the club's prestigious name can demonstrate superior environmental performance (Potoski 2017). For example, the club's name and authority can legitimize policy proposals within a country's governmental agencies; also, the club's brand can stand for a certain quality of work and thereby help to gain external funding for further climate activities; additionally, club membership can come with a leadership position, and the potential possibility of setting (environmental) standards for other countries; (d) *trust-building*: participation in the club has increased trust among club members; (e) *co-benefits*: members receive additional benefits that are produced as positive side effects from the clubs' mitigation activities, e.g., for sustainable development.

3.2 Methods

The central aim of this paper is to provide a multiple case study that sheds light on three specific innovative governance initiatives, active in climate policy. It is based on qualitative research that places the focus on examining political practice.

We analyze three heterogenous cases in an attempt to represent the diversity of the climate policy landscape: the G20, CCAC, and U2C. They each represent different climate policy objectives, governance levels, and structures. This inclusion of assumedly different types of coalitions suits a broad club definition, and it helps us to identify those club contributions and challenges that are common to these clubs in spite of their differences. For the case analyses, we triangulate different data sources. While for the G20, a rich sample of summit documents and action plans exists in addition to some academic and grey literature; the data availability is much more limited for CCAC and U2C. For this reason, the latter two cases rely more heavily on expert interviews to complement reports and other material published on the organizations' websites. A total of 18 semi-structured expert interviews were carried for all three cases.

This explorative-qualitative research design enables the consideration of club contributions that are difficult to quantify, e.g., the generation of support and awareness for policies. It can thus suggest answers to the question of what type of contribution (if any) is made. The above framework for analyzing climate clubs adds value to current academic debates as it uses the knowledge acquired from the major strands of the theoretical discussions on clubs to facilitate a systematic analysis and comparison of existing club initiatives. Instead of verifying hypotheses from theory, the practical findings from these case analyses generate assumptions that help to develop the conceptual debate on clubs further. Our heterogeneous cases further enable us to put the clubs framework developed by Unger et al. (2020) to use and explore its generalizability to other cases of climate clubs.

4 How do the G20, CCAC, and U2C contribute to international climate governance?

4.1 The G20

The G20 was initiated in 1999 as a forum for finance ministers to coordinate the prevention of financial crises. It is in principle a forum for international economic cooperation. However, since 2008, it has featured meetings of state leaders and today covers a much broader set of topics. This also includes climate-related issues such as climate finance, adaptation, mitigation, and clean energy transition. The inclusion of climate change on the agenda is the success of G20 members Mexico, Korea, France, and the USA. They sought to tackle climate change as a G20 issue, based on the concern that the UNFCCC had become ineffective in generating results. China and India, in contrast, argued that climate change should remain a clear jurisdiction of the UNFCCC (Kim and Chung 2012; Kirton and Kokotsis 2015). A body of literature has emerged which examines the climate and energy politics of the G20 (Kim and Chung 2012; Van DE Graf and Westphal 2011; Kirton and Kokotsis 2015).

The G20 cannot take binding decisions and has no permanent secretariat. It unites a diversity of interests but seeks to formulate ambitions that all members agree with in the final communiqués of each presidency. The G20's commitment to the PA poses a unique exception to this practice. Between 2017 and 2020, summit documents featured a special clause indicating that the USA, unlike the other members, does not support the PA (G20 Research Group 2020). The G20 presidency rotates annually, and each presidency oversees the agenda for the duration of its term (Röhrkasten and Westphal 2016).

The G20 has no formal connection to the UNFCCC process, nor does it appear as a negotiating block during the COPs. However, G20 members have sought to lend support to upcoming COPs through their communiqués. At the G20 summit in Seoul in November 2010, for instance, Japan openly pushed for a successor agreement to the Kyoto Protocol which would include all major emitters and would depart from the UN's approach of common but differentiated responsibilities. The G20 confirmed this stance at the Brisbane summit in November 2014, supporting an inclusive outcome at the upcoming COP21 in Paris. It thus contributed to preparing a common language that would be pursued in the negotiations of the PA. The G20, furthermore, has called for the implementation of adaptation and finance measures, in particular the UN Green Climate Fund (Kirton and Kokotsis 2015; Vener et al. 2019).[1]

Membership G20 has a fixed group of members which includes 19 major industrialized and emerging economies and the European Union (EU). Meetings are exclusive to its members as well as a select group of invited international institutions and countries (Cooper 2010; Röhrkasten and Westphal 2016; Sharma 2017). The group has a high *capability and problem solving capacity*, as G20 countries account for 77% of global primary energy consumption and 82% of global energy-related CO2 emissions (Röhrkasten et al. 2016). Moreover, its members are major financiers in key global governance institutions in the energy realm such as the International Energy Agency (IEA) and International Renewable Energy Agency (IRENA) as well as in UN institutions (Kim and Chung 2012). The group also features a high degree of *legitimacy* through including the most responsible actors for climate change, such as China and the USA as the largest CO2 emitters and major fossil fuel-producing and consuming countries

[1] Interview 17

such as Saudi Arabia and Russia. The G20 was founded to enhance exchange on economic matters. Its members are not united by a *common overall climate policy objective*. The group is therefore not a climate club, but rather an economic club with a climate governance work stream. Despite its relatively small, stable club size, it is particularly the heterogeneity of interests of its members which prevents bolder climate action. The G20's leadership role in climate protection is under constant jeopardy through climate laggard members including Russia, Saudi Arabia, and more recently, the USA. Recent G20 summits have therefore focused on non-contentious issues related to climate change, such as adaptation, infrastructural resilience, and clean energy innovations (Röhrkasten et al. 2018, G20 Research Group 2020).

Public good provision The G20 does not as such *engage directly in emissions reductions activities* on the ground, nor do G20 communiqués and action plans state goals regarding concrete, measurable emission reductions. Member countries pursue their individual emission reductions and climate policy commitments independent of the G20. Yet, some of the G20's activities do mark a joint commitment to climate protection and seek to have a guiding role for national and international *policy planning*. For example, the 2017 Hamburg Climate and Energy Action Plan for Growth sought to move the G20 from its stance of merely endorsing the UNFCCC to playing a role of its own in the UNFCCC process. The G20 will strive, the action plan states, to develop their economies and energy systems in a manner compatible with the climate targets set by the PA (G20 Research Group 2017). The plan commits the G20 members to cooperate and create learning opportunities to support each other in their NDC implementation. G20 presidencies, moreover, support emission reductions by building bridges on climate-related issues between countries with different political positions and geographic circumstances, finding consensus that takes these differences into account.

Possibly its strongest role lies in *advancing political dialogue* and raising awareness for climate change among its members and beyond (Victor 2017). The G20 action plans on sustainable development, climate, and clean energy issues are important tools for these purposes. They receive broad international attention and help the G20 both assume a signaling position and act as an international agenda-setter (Röhrkasten et al. 2016).[2] With their NDCs, members support the PA, signaling that many major economies are committed to international climate targets (Vener et al. 2019).

Further, G20 *enhances cooperation* on climate matters—among its formal members but also with global governance institutions and among transnational actors—through regular high-level exchange, networking, and coordination. One prominent example is the voluntary peer review process for fossil fuel subsidies, which is based on a 2009 declaration of intent to "phase out (…) inefficient fossil fuel subsidies" (G20 Research Group 2009). In monitoring the phase-out of fossil fuel subsidies, the G20 collaborates with institutions such as the IEA, the Organization of the Petroleum Exporting Countries (OPEC), and the Organization for Economic Cooperation and Development (OECD). Moreover, it endorses cooperation with and among transnational actors through various types of engagement formats such as Business20, Think20, and Civil Society20 in its governance process. The engagement formats themselves constitute a large global network of groups that deliberate—among others—on climate issues (Victor 2017; Röhrkasten and Westphal 2016).

[2] Interview 18

Additional benefits No direct *financial benefits* related to climate change can be attributed to G20 membership. Nevertheless, the G20 structure provides *knowledge incentives*, enabling members to exchange best practices in the area of climate protection. The G20 activities in the realm of energy efficiency, for instance, aim explicitly at facilitating technical exchange and knowledge sharing to advance sustainable development on a global scale (G20 China 2016). Most importantly, G20 membership comes with *reputational benefits*: The G20 as a high-level political forum has been accepted as a form of international authority and "brand," whose actions and positions receive considerable attention in the international climate policy community. Although the name is tied to mostly economic leadership, we find that its political power provides its members also with the potential of becoming environmental standard and example setters also beyond the G20. Stakeholders, including the public or other governmental actors, may give actions initiated by the G20 more weight than those of other groups. Moreover, the prestige of its membership is certainly conducive to international climate mitigation efforts. In addition, the regular ministerial meetings enable *trust building* and the establishment of regular communication channels. Further, through action plans, programs, communiqués, and at the annual high-level meetings, G20 presidencies have linked climate change mitigation to other policy fields, including energy security, air quality issues, and market developments (Röhrkasten et al. 2016, G20 Research Group 2009, IPEEC 2015) which may experience *co-benefits* from climate protection.

4.2 Climate and Clean Air Coalition

CCAC was established in February 2012 with the central objective of slowing the rate of near-term global warming through the reduction of short-lived climate pollutants (SLCPs), such as black carbon, methane, hydrofluorocarbons, and tropospheric ozone (CCAC 2015). Reducing SLCPs could cut the current rate of warming in half and avoid 0.5 C of additional warming by 2050 (UNEP 2011). SLCPs affect both the global temperature and the local and regional air quality. CCAC's additional objectives are improving air quality and public health, promoting food security and energy efficiency as well as alleviating poverty. Being a voluntary transnational partnership, it has no legal personality and is non-treaty based. The partnership is financed by its members on a voluntary basis. Funding is pooled into a trust fund that is mostly spent on SLCP reductions related project activities as well as the CCAC secretariat (CCAC 2014).

Launched largely independently of the UNFCCC, the emergence of the CCAC can be seen as part of the discontent with the progress under the UNFCCC. More recently, a cooperative relationship has evolved, and links between both institutions are increasing. CCAC has supported the work of the UNFCCC, for example, as a technical expert under the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) (UNFCCC 2014). Additionally, it often holds its high-level assemblies and meetings during the COPs. CCAC supports its member countries, for example, Mexico or Nigeria, with integrating SLCPs into their NDCs under the PA.[3]

Membership CCAC's members have the *capability and problem solving-capacity* for action on near-term climate change: With large GHG emitters such as Canada, the EU, India, and the

[3] Interview 7

USA, CCAC partners cover around 44% of the world's GHG emissions in total.[4] CCAC also includes many regions with high SLCP and air pollutant emissions. 18 of the 20 most polluted cities and 6 of the 10 world's largest cities are situated in CCAC countries.[5] Members can also be assumed to reunite economic capability to mitigate near-term climate change, as together they represent approximately 70% of the world's GDP.[6] CCAC can also be considered to possess a high degree of *legitimacy*, featuring developed countries with high historical responsibility for climate change (e.g., USA and EU), but then also developing country members from Africa, Asia, and the Americas especially affected by air pollution problems. The transnational character of the CCAC increases both its attractiveness to members and its relevance in terms of capacities and knowledge. [7]

CCAC members share *a common objective* of making progress on SLCP mitigation. Even though there is no entrance fee or obligatory quantifiable commitments for candidates, members are expected to make monetary or non-monetary contributions, endorse the coalition's framework, and propose meaningful action on SLCPs. This open membership policy provides relatively low barriers for new members (CCAC 2014). However, what interviewees perceive as a challenge is that many partners are not active at all or are unwilling to commit to significant action on SLCPs and that activity of members decreased over time.[8] In principle, this can hint at free riding, that is, members enjoying the initiative's benefits without bearing any cost or making any contributions. Still, not only increasing membership numbers suggest the attractiveness of CCAC but also many members see CCAC's specific constellation of actors as well as its new, timely, and informal format as a motivation for joining.[9]

Although the large and heterogeneous membership increases legitimacy, it also leads to many competing interests. Partners pursue different objectives and priorities within CCAC, which are not always easily compatible. Contentious topics include, for example, what funding should concentrate on,[10] whether the scope of activities should be broadened or narrowed, and whether on-the-ground-projects or international policy activities should be favored.[11]

Public goods CCAC has eleven sectoral working areas, in which initiatives, country, and non-state partners work together. Some of the implemented projects actively achieve SLCP *emissions reductions*. For example, CCAC reports a reduction of 12,668 tons of methane emissions from the oil and gas sector in 2016–2017 (CCAC 2017a). Many activities involve capacity building measures. Although these projects function as best practices, they stop short of achieving emissions reduction at a large scale. Also, in many cases, the data is insufficient to provide a robust, quantitative accounting of emissions reductions based on the coalition's activities.[12]

[4] Analysis by the authors based on data published by UN, UNFCCC, UNEP, The World Bank, and the World Health Organization (WHO). Available upon reasonable request.
[5] Ibid.
[6] Ibid.
[7] Interviews 3, 4, 7, 8, 9, 10, 11, 13 6, 9
[8] Interviews 6, 7, 1 1, 10, 14
[9] Interviews 4, 7, 8, 9, 10, 11, 13
[10] Interviews 6, 7, 8, 10, 13, 14
[11] Interviews 6, 7, 8, 13, 14
[12] Quantifying emission reduction is challenging, on the one hand due to lacking or inadequate technical data, e.g., for SLCPs, and on the other hand, it is difficult to attribute emissions reductions to the club (here CCAC) per se, even when it played a role in project implementation. It is likewise difficult to attribute emissions reductions to activities like capacity building.

CCAC has also successfully *supported policy planning*, through the development of SLCP policies at the national and local level.[13] According to CCAC'S reporting, it has had a role in the development and adoption of eleven national laws, regulations, or standards in the areas of diesel, waste, and bricks policies in at least eight different countries (CCAC 2017a). CCAC further supports the Montreal Protocol with the Kigali Amendment and the PA. For instance, it promotes SLCP reductions in these agreements through its publications, events, and High Level Assemblies (HLAs) with government officials (CCAC 2018) or by giving technical support for the inclusion of SLCPs in NDCs.[14]

A major strength of CCAC is *advancing political dialogues* and raising the awareness of near-term climate change and SLPCs. Activities such as its Ministerial Roundtables and the regularly held HLAs with their political communiqués also increase the attention on SLCPs internationally (CCAC 2017b). SLCPs have appeared on the agendas of the G7 and the General Assembly of the Parliamentary Confederation of the Americas. A majority of partners sees a main strength in the CCAC's work in establishing SLCPs as a topic per se and at different governance levels.[15] It brings SLCPs to the political agenda and gives a neglected "climate" topic attention at the national and international level. Another major asset of CCAC lies in *cooperation enhancement*. It provides a strong cooperation and assembles a large well-informed network.[16] The coalition is built on the regular exchange on scientific and technical topics paired with a very strong scientific basis provided by CCAC's Scientific Advisory Board and non-state partners.

Additional benefits CCAC produces several *additional benefits* for its members. Financial support, in the form of funding for SLCPs implementation or capacity building projects, is provided, first and foremost for developing countries. It can also have a facilitating role in generating funding from other sources such as the UN Green Climate Fund or the private sector. *Knowledge incentives and methodologies*, such as technical support and expertise on SLCP reductions, are among CCAC's main assets. For example, the Long-Range Energy Alternatives Planning-Integrated Benefits Calculator (LEAP-IBC) is a planning tool that helps governments to assess GHG, SLCPs, and other air pollutant emissions (Stockholm Environment Institute 2018). *Reputational benefits* are achieved, because CCAC is perceived as an authority in the field of climate and air quality, and its name is associated with high-quality methodologies or projects. A "CCAC-labeled" activity may gain stronger recognition from international funding organizations (e.g., the Green Climate Fund) and thereby increase the country's chances to secure funding.[17] The name "CCAC" has also helped intragovernmental politics: Policy makers argued that it provided them with an argumentation for the use of stronger climate and air quality policies and innovative methodologies.[18] Another additional benefit is *trust-building* among members. CCAC meets at least twice per year, and partners cooperate closely in initiatives. Such positive member relationships can yield advantages in other governance institutions or in bilateral political and economic relations.

[13] Interviews 10, 7
[14] Interview 7
[15] Interviews 3, 4, 7, 10, 11, 13, 14
[16] Interviews 4, 7, 8, 10, 11, 13
[17] Interviews 6, 13, 14
[18] Interviews 6,11

4.3 Under2 Coalition

U2C started with a Memorandum of Understanding (MoU) (U2C, n.d. a) in the run-up to COP21 and the PA in May 2015, based on an initiative from the US state California and the German state of Baden-Württemberg. The objective is to meet the target of keeping global warming under 2 °C, aiming at 80 to 95% GHG reductions below 1990 levels and/or per capita annual emissions of less than 2 metric tons of carbon dioxide-equivalent by 2050 (U2C, U2C, n.d.-a). U2C is administrated by a secretariat, operated by the Think Tank The Climate Group. It has a Steering Group and the Co-Chairs as strategic bodies (U2C 2018a).

U2C is closely connected to the PA and the UNFCCC process even though sub-national jurisdictions figure as "non-party stakeholders" and have no negotiation authority here. U2C presented its initial MoU at COP 21. Through its presence at the COPs and its activities, it aims to accelerate official negotiations.[19] Also, most of the annual member meetings take place at the COPs. However, some members perceive that a stronger representation and recognition in the official process under the UNFCCC would support U2C's objectives.[20]

Membership U2C is constantly growing. So far, 220 jurisdictions in 43 countries have signed on. Signatories are state, regional, provincial, city and local governments, and administrative authorities. National governments can support the objectives formulated in the MoU and provide financial resources or expertise to the U2C (U2C 2018b). Its fast growth poses challenges to administrative management in terms of determining priorities and substantiating activities.[21]

U2C's size and diversity support its *problem solving capacity*: It represents 1.3 billion people and 43% of the global economy (U2C 2018c). Large subnational actors both responsible or especially vulnerable GHG emitters such as California, Baden-Württemberg, and regions in India and in China are part of the coalition (U2C 2018b). Especially its focus on subnational actors adds to the *legitimacy* of U2C. Subnational actors are left out of the official UNFCCC process, yet they may be better prepared to cope with specific local concerns. Thus, in many cases, they open a window of opportunity for activity where national action fails.

U2C members are united under *a common climate change mitigation objective*, to be achieved by each member with individually set GHG reduction targets. U2C has a relatively open membership policy, but members have to demonstrate how they plan to achieve the "under 2 °C" goal (U2C n.d.-b). U2C members show very different degrees of activity: The 2018 report shows that only 31 members reported policy action (U2C 2018d). The interviews carried out for this paper revealed that only a small circle of members is very active in the U2C, which on the one hand can drive quicker actions.[22] But on the other hand, it could hint at a situation of free-riding by some members, who benefit from the U2C label but make no contributions. Another challenge to the group's climate ambitions is the strong heterogeneity of the members: size and capacity, political, structural, and legal context, including the significantly varying autonomy with which decisions can be adopted. This hinders the transferability of policy instruments and commitments, as well best practices.[23]

[19] Interview 15
[20] Interview 16
[21] Interview 15
[22] Interview 15
[23] Interviews 15, 16

Public goods U2C engages in *emission reductions activities* in several different ways. To sign on to membership, jurisdictions need to set GHG reduction targets in line with the Under2 MOU (U2C 2019). They perceive their signature on the Under2 MoU as a reputational commitment that helps to drive activity.[24] Members are asked to report on their GHG emissions and climate actions in the annual disclosure reports (U2C n.d.-b).[25] They are encouraged to conduct a data inventory, and the coalition provides an analytical tool to evaluate policies (U2C 2018e). Members regard the reporting structure as a main success of U2C.[26]

Otherwise, the club engages more indirectly in emission reductions, through the realization of diverse coordination and cooperation activities. U2C s*upports subnational policy planning*. It seeks to help its members to plan the policy pathway towards reaching their goal, e.g., through initiatives, such as the Pathway Project or Peer Learning Project (U2C 2020b; U2C 2020a). Also, U2C seeks to stir action in key areas, for instance, through its Zero Emissions Vehicles or the Industry Transition Platform initiatives (U2C 2020c). Yet, many of these projects have only been launched recently, and it is difficult to evaluate their concrete results or effectiveness. Likely, the most important success of U2C is *advancing political dialogue* and the empowerment of a group of actors that has been somewhat neglected under the UNFCCC process. For example, it raises national and international awareness of the potential of subnational climate change mitigation activities and their contribution on a global scale.[27] The large U2C network *enhances cooperation* between businesses, governments, and non-governmental institutions, for instance, through the international conferences it organizes (U2C 2018a; U2C 2018f).

Additional benefits U2C established the "Future Fund" to *financially support* members' state-level climate action in developing and emerging economies (U2C 2019).[28] However, to date the fund holds relatively small amounts of money. For example in 2018, it received donations of some 152,000 USD (U2C 2018g). Interviews suggest that the availability of funding for projects could be decisive for the future of U2C.[29] A non-material incentive to join the coalition is *knowledge provision*. U2C has established a peer learning and knowledge sharing platform which its members perceive as a major asset.[30] The U2C secretariat facilitates the transfer of knowledge on mitigation actions,[31] for instance, by organizing background briefings, communication, and translation services (U2C 2018h). Also, some *reputational benefits* can be expected from U2C membership, as U2C is increasingly renowned in the international climate policy landscape and is establishing a reputation for subnational climate leadership.[32] Currently, U2C's reputational benefits are mostly intragovernmental: Policy makers interviewed stated that being a member helped them to gain stronger recognition from the national government.[33] The "label" U2C gives those policy makers active in the initiative

[24] Interview 15
[25] Interviews 16, 17
[26] Interview 15
[27] Interviews 15, 16
[28] The Future Fund Progress Report 2019 names only projects in the member jurisdictions to have received this funding.
[29] Interviews 15,16
[30] Interviews 15, 16
[31] Interview 16
[32] Interview 16
[33] Interviews 16, 17

the leverage to exercise more pressure on their national governments to act on climate change. Moreover, belonging to a renowned climate initiative can incentivize members to live up to its goals.[34] It is likely that *trust-building* has the potential to unfold as a U2C benefit, as well. Signatories and endorsers meet annually at the COPs or at other major climate events such as the Climate Action Summit establishing regular communication channels among the members (U2C 2018a).

5 G20, CCAC, and U2C in comparative perspective

The three initiatives differ significantly in how they deal with climate change as a topic: While the G20 was launched with a clear economic focus, and energy and climate issues only emerging on its agenda in 2009, CCAC and U2C center on mitigation of global warming and further environmental aspects. Table 1 shows the analyzed features of the three clubs.

What all three initiatives have in common is that their activities on climate change mitigation were a response to the perceived failure of the UNFCCC process and a conviction that extra action would be necessary to cope with climate change. Their relationship to the UNFCCC is complementary and not competing. U2C is very closely linked through its direct reference to the PA's objectives, and CCAC has ties to the UNFCCC through active cooperation. The G20's work on climate and energy matters has only very few direct procedural connections beyond an official endorsement of the UNFCCC. It often assumed a role as a "pacemaker" for the COPs once it included climate issues on its agenda. Due to the prominence and international influence of its members, its own climate agenda has been able to support consensus within the UNFCCC.

The initiatives' *membership* constellation is relevant but differs significantly. The G20 is the only initiative in line with a narrower definition of a club in terms of size (e.g., Naim, 2009). With far more than one hundred members each, CCAC and U2C fit better into Green's (2017) definition of pseudo clubs. In all three initiatives, members entertain very different interests and motivations, which occasionally presents a challenge to decision-making.

In general, we find that these clubs have a relevant role in climate governance, *producing public goods* in several ways. The strength of all three lies in a supporting, coordinating, and guiding role, which rather indirectly achieves emission reductions but can prepare for the implementation of policies such as the PA.

All three initiatives build on the willingness of individual members to realize emissions reductions. Only U2C has set relatively concrete goals for members to achieve. Both CCAC and U2C pursue climate project activities, which to some degree reduce emissions on-the-ground. These are rather best practices and often focus on capacity building. A number of activities can contribute to preparing the playing field for future emissions reductions. Likely, the central value-added of these three initiatives in climate governance has been that of *strengthening a strategic dialogue through influencing political agendas and raising awareness* in specific contexts and communities. They have raised additional and "niche" facets of the climate change problematic to a high governmental level, such as issue of fossil fuel subsidies, the formerly neglected topic of SLCPs, and the entrepreneurial potential of subnational actors, thereby gaining support for climate policies and creating more favorable political conditions for their implementation—a finding already

[34] Interviews 15, 16

Table 1 G20, CCAC, and U2C in comparison

Criterion	Manifestation	G20	CCAC	U2C
Membership	*Capability and*		*problem-solving capacity*	Major GHG emitters, high economic capacity
	Mix of major + minor emitters, but major SLPC emitters; high economic capacity	Mix of major + minor emitters; high economic capacity		
	Legitimacy	National governments + EU (most responsible actors)	Multiple government levels + non-state actors (most responsible + vulnerable actors)	Subnational governments (+national governments as endorsers) (most responsible + vulnerable actors)
Common (climate) objective	X	Yes, but unspecific commitments	Yes, specific goals and commitments	
Public goods	*Direct reductions of emissions*	X	Some GHG reduction projects	Some GHG reduction projects
	Support of policy planning	Some	Yes, for multiple government levels	Some, project-based activities
	Political dialogue	√	√	√
	Cooperation	√	√	√
Additional benefits or "club goods"	*Financial incentives*	X	Limited project funding + indirect, e.g., access to technologies	Limited project funding
	Knowledge and methodologies	√	√	√
	Reputational benefits	√	√	√
	Trust-building	√	√	√
	Co-benefits	√	√	√

Source: The authors

suggested in Stewart et al. (2017) and Victor (2015). G20's recent commitments to climate and sustainable energy issues have received broad attention not only within the group; they send a signal for commitment to climate policy from the world's major economies, energy consumers, and climate polluters. Thus, again, in many aspects, CCAC and U2C resemble stronger what Green (2017) labeled as pseudo clubs. Also, the G20, though it comes closer to a classic economic club (such as suggested by Buchanan (1965) or Nordhaus (2020)), assumes a softer, facilitating role and benefit structure in its climate workstream.

In many cases, the three clubs *incentivize policy planning and capacity building* for the implementation of policies. CCAC has successfully provided guidance to local and national SLCP policies, and U2C supports climate actions taken in subnational jurisdictions. The G20 operates at an overarching level when suggesting certain practices or pathways for its members. In this regard, our analysis of club practices confirms previous assumptions that clubs accompany and support other governance mechanisms and policy making (Potoski 2017).

Following the expectations of several scholars (e.g., Falkner 2016; Hovi et al. 2017), we find that indeed an important task of our three cases lies in the creation of a *network* and in the *enhancement of deeper cooperation*. All three meet club features suggested by Falkner (2016) in providing a venue to discuss important climate-related topics, expose and test different positions, and create common ground for further collaboration under the UNFCCC and the PA. The role of CCAC and U2C can also be seen as orchestrators as they bring a diversity of actors together and coordinate and direct their actions. All three clubs build common narratives for climate protection and reinforce the implementation of the PA. This, in turn, provides the preconditions for the international climate policy process under the UNFCCC and beyond.

All three, the G20, CCAC, and U2C, provide sufficient *additional benefits* to make members join or stay in the club. However, in the G20, climate change mitigation is only one issue among many, the glue holding the club together being the prominence of its members rather than climate change benefits. For CCAC and U2C, we found additional benefits, which primarily benefit their members, but ultimately suit the common objective of climate change mitigation. Despite their diversity, we find that all three clubs have in common that it is their strength to provide non-quantifiable benefits. Their institutional structure and regular member exchange *enhance trust* between members, which can also pave the way for future cooperation on climate change. As suggested in Potoski (2017), *reputational benefits* are a major asset of the clubs, even though they vary in nature. Club membership in all three cases means a "label" or a particular authority. Activities or recommendations worked out under the clubs' name have a special value attached to it.

The G20, CCAC, and U2C have in common that their focus has become more integrative, as suggested by Stewart et al. (2017): Climate change is increasingly coupled with other topics such as development, energy security, or public health, which can provide *co-benefits* beyond climate change mitigation.

6 Conclusion

The main finding of this paper is that all three cases have an important role in global climate governance. Their contribution lies in "preparing the playing field" for future emission reductions by raising awareness, orchestrating different actors and actions, and establishing a large cooperation network. The examined cases support previous research that finds that climate clubs assume a supporting and complementing role in international climate change governance (e.g., Stewart et al. 2017). In assuming this role, they contribute to the PA in at least three manners: First, by enabling policy planning (e.g., supporting NDC updates) and, to some degree, providing mitigation opportunities additional to those promised under the PA; second, by strengthening implementation capacity (e.g., providing best practices and technologies); and third, by increasing overall support for the PA.

Overall, the utilized analytical framework rooted more generally in existing climate club conceptual approaches and based, more specifically, on Unger et al. (2020), proved to be a useful heuristic for our comparative case study, facilitating a "meso-level" perspective on a sample of today's heterogenous climate club initiatives. Yet, the case comparison also suggests that the role of (climate) clubs is more complex than often assumed in the literature.

First, this research finds that membership constellations are relevant for the functionality of the clubs in various, sometimes contradictory ways. While CCAC's and U2C's large membership adds to the clubs' political weight and network, it also challenges their decision-

making procedures. A large club size stands in contrast to the initially claimed purpose of clubs to provide quicker progress than large fora such as the UNFCCC (Buchanan 1965; Victor and Keohane 2010; Victor 2015). However, in this study, diverging and conflicting interests are a problem common to all three cases, regardless of their size. This finding might suggest that rather than a specific club size, it is the ability to find common ground and seize windows of opportunity, which builds the club's potential to contribute to climate policy. Another observation is that the progress of a club is often contingent on a few leading members who advance the club's objectives. In both CCAC and U2C, there is a small group of especially active members. In the G20, climate ambition strongly depends on the respective presidencies. However, uneven ambition and sometimes lack of activity and commitment have also led to discontent among members in all three clubs. This divergence of goals can be the reason for free riding, when members enjoy the initiative's benefits without making any contributions (Prakash and Potoski 2007). In this regard, our findings somewhat confirm Prakash and Potoski's (2007) notion of shirking: members join a voluntary club and claim to be contributing to a public good but fail to live up to their promises. For the club, this bears the risk of reduced credibility. While stronger monitoring and sanctioning mechanisms could be a solution (Prakash and Potoski 2007), we find that especially for CCAC and G20, where goals remain rather unspecific, stronger control mechanisms would be very difficult to establish, also because the secretariats or presidencies of these clubs generally lack a mandate to do so.

Second, even though funding is essential for the club, in our sample, immediate financial benefits are not what holds the club together. In the CCAC and U2C, there is only very small financial support for single projects available, and G20 members do not receive immediate financial benefits from their climate-related activities. Yet, for the CCAC and U2C, their role of supporting, guiding, and orchestrating climate action is also shaped by their funds. In both cases, small climate projects have only a "lighthouse" character and cannot produce large scale on-the-ground emissions reductions.

Third, clubs evolve dynamically over time and function with some degree of independence. CCAC and U2C have seen a constant membership increase, and in the G20, climate became a new workstream that faced curvy roads over time. Also, all three clubs have in the past been subject to structural changes and challenges. For example, government changes have had consequences for the clubs' agendas and financial capacities. Nevertheless, the three clubs seem to move forward with considerable independence, an aspect suggested by Ostrom (2010) as typical for polycentric systems. Even in times of gridlock and conflicts over international climate policy, such as around the UNFCCC COP 15 or the US government under Donald Trump, the climate actions of the clubs progressed, albeit at times with reduced speed.

These findings on clubs reflect the changes that characterize the climate governance landscape today, namely, polycentricity as well as the heterogeneity of actors and actions. Notwithstanding, the perceived complexity of today's clubs reveals limitations to the concept's use: For example, the criteria applied to evaluate the cases cannot serve to actually evaluate how successful a club is, e.g., whether the supported policies effectively lead to emission reductions. Thus, in order to complement the analysis of the clubs' contribution to the PA, the inclusion of more quantitative data, or the combination with club approaches that feature economic modelling of club activities (e. g. Hovi et al. 2017) could be helpful. Further, although the clubs' supporting role is strong and important, the analysis of club practices suggests that they do not represent an alternative to countries' commitments under the UNFCCC. Clubs cannot take over the main mitigation and implementation responsibility, and countries still need to strengthen their individual efforts. Also, these club cases are no

alternative to international agreements, as Nordhaus (2020) suggests. The cases analyzed here show no signs that free-rider issues are overcome.

Overall, the comparative analysis of non-traditional climate policy initiatives and their overlaps merits further investigation, especially as the number of initiatives is growing steadily and new actor constellations are emerging.

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Data availability Interviews were carried out between May 2018 and August 2019 with country and non-state members from the CCAC and the CCAC Secretariat; U2C members and the U2C Secretariat; further scientific experts on the G20. The datasets generated during the current study through expert interviews, such as interview transcripts and notes, are not publicly available in order to keep individuals' privacy, but are available from the corresponding author on reasonable request.

Code availability Not applicable.

Declarations

Conflict of interest The authors declare no competing interests.

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