



# Environmental commitments in different types of democracies: The role of liberal, social-liberal, and deliberative politics

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## ABSTRACT

Since a more substantial recognition of environmental degradation in the 1960s, the scholarly community has looked at democracy with mixed feelings. Some assert that democracy is devastating for the environmental performance, some claim the opposite, while others suggest that certain democratic models are more successful than others in paving the way for sustainability. Both political theorists and empirical scholars add fuel to this debate, and neither has settled the argument yet. In this paper we make use of recently collected data from the Varieties of Democracy project on different conceptions of democracy and address both these literatures. We empirically test whether different features of democracies, i.e., liberal in its thinner understanding, social-liberal, and deliberative, are more or less beneficial for environmental commitments. We investigate which of these features make democracies more prone to produce environmental policy outputs – adopt climate laws, deliver on them, develop stringent environmental policies, and incorporate sustainability into economic policies. We find that democracies with stronger deliberative features adopt more, but not necessarily stricter or more effective, environmental policies. Instead, democracies with stronger social-liberal features adopt both stricter and more effective policies.

## 1. Introduction

Which political system is best suited to deal with problems related to the environment and, by extension, to contribute to global sustainable development? Despite a rather short history of public and political attention – only some fifty to sixty years – environmental problems have already taken on many different guises, and every one of them is, indeed, politically challenging. In the 1960s, environmental problems primarily referred to rather isolated issues, such as emissions and pollution. Gradually, focus on the environment increasingly became a matter of global sustainable development, including an emphasis on both pure environmental status and economic and social development, where the principal actors and agents of moral interest and concern exist both today and in a distant future. As we see it, the more complex and all-embracing environmental issues become, the more justified it is to simultaneously ask, *which political system is best armed to deal with environmental problems?*

One popular approach is to conclude that since most environmental problems have been generated in democratic countries, democracy needs to be exchanged for some other form of government if we are ever

to overcome environmental problems (Ehrlich, 2013; Heilbroner, 1974; Kennedy, 1993; Ophuis, 1977). This argument has gained some additional fuel lately as investment in green technology has rapidly expanded in China, according to some observers, supposedly indicating that authoritarian regimes are better equipped to deal with environmental challenges (see Randers, 2012). This approach, however, falls short on a number of premises, including the empirical fact that other than China and Singapore, authoritarian regimes have generally not paid active attention to environmental problems.

Instead, we aim to investigate the question as to which political system is best suited to deal with environmental issues from two other angles. First, in the field of green political theory there is a mature and well-elaborated debate concerning which political system is best equipped to cope with environmental problems. At least one common denominator within this, by now rather dated, literature is that democracy is not necessarily bad for the environment as such, but rather that the liberal-democratic model is the major root for most of the environmental challenges that we see today. One reason for this is an assumed close relationship between liberal democracy and negative political rights on the one hand and capitalism/the market on the other,

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both of which can be devastating for the environmental cause (and, for that matter, for any ambitions to upgrade moral concern and responsibility such that future generations' interests are included into present-day decision-making). Therefore, alternative models have been advocated, and these are primarily i) social-liberal democracy and ii) deliberative democracy. A shortcoming with this theoretically founded literature is, however, that it has seldom, if ever, been subject to empirical scrutiny. Thus, apart from a few case studies investigating whether alternative democracy models would be more beneficial for the environment (Bäckstrand et al., 2010; Dryzek, 2011, 2001), it remains an open question as to whether this is actually the case.

The second strand of literature is much less theoretically informed, and instead focuses on studying whether democratic countries are generally better equipped to generate environmental solutions compared to authoritarian regimes (Bättig and Bernauer, 2009; Li and Reuveny, 2006). The latter approach can, and has been, criticized for not distinguishing between different types of democratic models or regimes. A likely reason for this empirical gap has been the lack of available data.

In this paper, we amalgamate these two approaches and empirically scrutinize if countries that are drawn towards (thin) liberal-, social-liberal, or deliberative democracy are more successful in developing environmental commitments. Taking inspiration from Bächtiger et al. (2018) asserting that "Like many human ideals and almost all democratic ideals, the ideals that animate deliberative democracy are aspirational—ideals that cannot be achieved fully in practice but that provide standards toward which to aim, all other things equal", we consider the three democratic features investigated here—and the ideals towards which these features are aiming—as *aspirational*, and neither as fully factual nor possible to implement in its completion. We are thus not attributing countries to a certain political system, but rather trying to categorize them as having more or less of the three features derived from their respective political constructs.

Our measures of different features of democracy are founded on data from the Varieties of Democracy Project and the Index of Economic Freedom from the Fraser Institute (2020), while data on environmental commitments are from Climate Change Laws of the World Database (2020), Eskander and Fankhauser (2020), OECD statistics (Botta and Kožluk, 2014), and the expert survey for the Transformation Index from Bertelsmann Stiftung (Donner et al., 2020).

Our analysis contributes to an 'evaluation' of the more than fifty-year-old academic debate concerned with determining which political system is best suited to cope with environmental problems. Our analysis also provides grounds for further theorizing on how future societies can successfully deal with the environmental challenges.

In the next section, we first account further for the debate on the relationship between different democratic models and the environment. Further, we describe our empirical strategy, including operationalization of our concepts, and present models in our statistical analyses. Thereafter, we present the results, followed by a discussion and a concluding section in which we critically examine our endeavors and discuss how this strand of research can be further advanced.

## 2. Theory and previous research

Reaching sustainable development goals is an arduous task for any political system. The question is – is it equally difficult for all political systems, or are some better equipped to secure strong environmental commitments than others? In what follows, we briefly introduce three features of democracy that have dominated not the least the earlier generation of green political theory, concerned with the relationship between democracy and the environment - liberal, social-liberal, and deliberative democracy (see, for example, a discussion on all three models in Barry, 2001, 1999; Lafferty and Meadowcroft, 1996; Lidskog and Elander, 1999; Schlosberg et al., 2019).

However, one should be aware that in the more recent theoretical literature, there are a large number of normative theoretical constructs

argued to be desirable alternatives to primarily liberal democracy, if they were ever to be sufficiently implemented. Several of these alternative perspectives can be depicted on a continuum between *ecological* and *environmental* democracy, as proposed by Eckersley (2019). Theories drawing towards the *environmental democracy* end of the scale, tend to suggest that liberal democracy would be better at generating sustainable development if existing institutions were reformed and if capitalism incorporated environmental values to a larger degree and expanded participatory governance. Theoretical perspectives drawing towards ecological democracy instead tend to set out a more fundamental critique of all liberal-democratic environmentalism and often advocate agendas that are considerably more transformative, participatory, cosmopolitan, and ecocentric (Agyeman et al., 2016; Biermann and Gupta, 2011; Kramarz and Park, 2016; Pickering et al., 2020). In this more recent normative literature, we also find suggestions for issue-specific forms of democracy, such as carbon democracy where it is argued that the rise of modern democracies is entwined with the development of fossil fuel industries, making it difficult to decarbonize existing democracies (Mitchell, 2011) and energy democracy concerned with discovering pathways to the normative goal of democratizing energy production and consumption (Szulecki, 2018).

Since the purpose of this study is not to empirically analyze whether just any desirable theoretical democracy construct is or would be more or less eligible, seen from an environmental perspective, but whether countries with different *existing* democratic features vary in their commitment to the environment over time, we here only operate from the suggested three features: (thin) liberal, social-liberal, and deliberative democracy. The benefit with this approach is that all three of these features various countries in the world already "impersonate" to different degrees (Coppedge et al., 2011). Our hope is, however, that this new way of examining the democracy-sustainability nexus may encourage future studies to find ways and empirically investigate also more normatively motivated and specific democracy ideals, such as many of those to be found on Eckersley (2019) continuum between environmental and ecological democracy.

### 2.1. The flouted (thin) liberal democracy

Over the years, many social theorists have argued that implementation of pro-environmental policies would be particularly difficult for/in liberal democracies, typically claiming that there are certain 'inherent weaknesses' of liberal democracy (De Geus, 2001, p. 20 ff) and thus that the whole foundation of liberal democracy is incompatible with environmental concerns (cf. Dobson, 2007, p. 164 ff).

Some assert that to claim a strong concern for environmental issues would violate the whole foundation of liberal democracy, that is *autonomy* and *individual self-rule* (Mathews, 1995; Sonnenfeld and Taylor, 2018). This emphasis on individual freedom and autonomy works against the emergence of ecological identity and consciousness (Mathews, 1995, p. 94). Another critique concerns limits to the problem-solving capacity of liberal democracy. For example, the *distribution of power* in liberal democratic systems is inevitably skewed, and business always has a 'privileged' position due to the financial resources available to it (Dryzek, 1992a, p. 22 ff). Liberal democracies also identify and *disaggregate* environmental problems based on the *particular interests* of affected parties. At the same time existing 'liberal democratic bargaining processes [...] deal very poorly with uncertainties and complexities of ecological problems' (Eckersley, 1995, p. 170). The *time horizon* in a liberal democracy is often no longer than that of the market (Dryzek, 1992b) and electoral cycles (Eckersley, 1995). Furthermore, liberal democracy is *addicted to economic growth* because if growth ceases, then distributional inequalities become more apparent. This fear of economic downturn means that liberal democracies are 'imprisoned by the market's growth imperative' (cf. Hayward, 1998, p. 162).

As we can see, many of the theorists early on opposing liberal democracy's environmental credentials describe it as a very *restricted*

form of democracy. It represents a compromise between liberalism's primary concern with individualistically conceived *political* and *property rights* on the one hand, and a vision of democratic *representation*, *participation*, and *accountability* on the other (also see [Barns, 1995, p. 120](#)). Such interpretations of 'liberal' prevent the state from interfering into individual liberties and regulating behavior towards environmentally friendly standards.

We would here like to emphasize that the theories and theorists criticizing liberal democracies rarely, if ever, discuss liberal features pertaining to the rule of law and constraints on the executive. Instead, they focus on a very thin understanding of liberal democracy and hypothesize that liberal democracy, as founded on this thin understanding of liberalism, should be a very poor political system when it comes to overcoming large-scale environmental challenges, be they generated in the past or still to come. In more general political theory, however, these additional features are usually key components of most liberal-democratic models ([Dahl, 1998](#)) and can be beneficial for securing environmental commitments on the political agenda (cf. [Povitkina and Bolkvadze, 2019](#)). As our goal is to scrutinize the arguments brought up in green political theory, in the main part of our empirical analysis we focus on the aspects of liberal democracy relevant to these arguments. However, in the additional checks, we explore the role of rule of law in addition to the thin liberal features of democracy to assess the potential of that feature to a larger extent than much of green political theory generally allows for.

## 2.2. Social-liberal democracy

A response to the rather aggressive critique of thin liberal democracy is built on an alternative understanding of liberal democracy, that is, social-liberal, or in the words of [Held \(1997\)](#), developmental democracy, initially pronounced by (non-environmentally oriented) political theorists such as [Rawls \(1972\)](#), [Dworkin \(1981\)](#), [Raz \(1989\)](#), [Sen \(1992, 1988\)](#) and [Rothstein \(1998\)](#). There are at least three lines of argumentations that can substantiate such a claim (cf. [Achterberg, 1993](#); [Jagers, 2007](#)).

First, social-liberal understanding of liberal (democracy) allows for the inclusion of both negative and positive liberties and rights. In this way, it (at least theoretically) opens up the possibility that a healthy environment can be regarded as a positive and substantial right. Such a right is hardly plausible in a thin understanding of liberal democracy, as that would immediately be seen as a violation of more fundamental negative liberties and rights, such as the right to hold private property. Thus, it is conceivable that social-liberal democracies are more likely to protect the environment than thinner and more protective liberal democracies. The stronger the legal status such a positive environmental right has in a country, the more vigorously the government can act to the benefit of the environment, since what is at stake is actually the guarantee of citizens' equal rights to a healthy environment (cf. [Gleditsch and Sverdrup, 2003](#)).

Second, the environment is commonly associated with development (cf. sustainable development). This often implies that unless countries and their citizens are enjoying a certain level of general social and economic wealth, there is a pronounced risk that the environment will be damaged due to factors such as lack of investment in efficient production and consumption and the risk that retained poverty will drive environmental degradation. If this is correct, then it is likely that the more developed, socially and economically, and social-liberal a country is, the better it will perform with regard to the environment ([Scerri, 2012](#); [Wissenburg, 2006](#)).

Third, there are also a number of, somewhat more political-philosophical, reasons to assume that governments in countries in which the ideological and political-cultural orientation is guided by more social-liberal principles could be expected to have more 'space' to act to the benefit of the environment. Most notable is the possibility to extend several classic principles asserted by a number of renowned

**Table 1**  
Three democracy models.

Democracy model	Main features
Baseline: Electoral Democracy	Thin procedural democracy: elected officials free and fair elections universal suffrage freedom of expression/media freedom of association
'Thin' liberal democracy	Thin procedural democracy; strong individual liberties and strong markets
Social-liberal democracy	Thin procedural democracy; levelled out inequalities, including economic inequalities and social inequalities
Deliberative democracy	Thin procedural democracy; influence from social movements and citizens through public deliberation

(more or less) social-liberal theorists (cf. [Jagers 2007](#)), such as [Mill's \(1884\) no-harm principle](#), [Raz's \(1989\) generous understanding of state-neutrality](#), [Sen's \(1992\) equality of capabilities](#), [Dworkin's \(1981\) principle of equal concern and respect](#) and [Gewirth's \(1978\) autonomy principle](#).

While there are several arguments that can be used to substantiate the claim that social-liberal democracy should be more successful in generating pro-environmental politics, including the above-mentioned principles and the fact that a healthy environment can be considered a human right, it is important to emphasize that any such environmental inclusion and extension is achieved at the price of some reduction in the protection of other liberties and rights, especially the right to hold property. Thus, a green social-liberal democracy is most likely to be encumbered with higher income and wealth taxes but also be more ambitious in 'pushing' environmental policy instruments, such as various environmental taxes.

## 2.3. Deliberative democracy

Rather than thin understandings of liberal democracy, green democratic theorists have also commonly suggested varying forms of decentralized democracy, sometimes called 'strong' democracy ([Eckersley, 1995, p. 171](#)). The most popular variant of strong democracy discussed among greens is various forms of 'deliberative' democracy ([Barry, 1999](#); [De-Shalit, 2000](#); [Dryzek, 1990, 1987](#); [Dryzek et al., 2019](#); [Eckersley, 2019](#), [Eckersley, 1997](#); [Hayward, 1998](#); [Jacobs, 1996](#)). Such democracy refers to a form of collective decision-making that stresses the community over the market or the state as the location for first-order decisions concerning social-environmental relations.

This means that such a democracy makes the state and the market the instruments of the democratic decisions of the community. That is, the deliberative 'speech situation' reduces former power relations in such a way that each and every interest now speaks and argues on an equal footing, that is the best argument wins, no matter whose argument it is. Some even claim that in situations in which the good arguments outdo the bad ones, individuals' opinions can be changed in such a way that different opinions are not only modified, but also rectified, i.e., by allowing for collective reason, a former controversy can potentially even end up in 'consensus' or at least a deepened joint understanding among the collective (cf. [Hayward 1998](#); [Habermas, 1996, p.100](#); [Cohen, 2009:248–251](#)). As deliberative democratic institutions offer opportunities for broader public participation for a diverse set of actors, as well as setting a platform for deeper and more enlightened public debate, deliberative democracy is argued to benefit environmental commitments significantly more than the thin liberal variant ([Smith, 2003](#)).

In [Table 1](#), we summarize the main features of the different democracy models or ideal types as hypothesized in the theory, starting with the baseline democracy model, which is the thin procedural

democracy, conceptualized by Dahl (1971) and here termed electoral democracy.

### 3. Empirical research on democracy and environmental performance

Previous empirical research investigating whether democracy is beneficial for the environment has shown mixed results. The existing literature predominantly assesses the performance of democratic countries compared to authoritarian regimes in different types of environmental outcomes, such as the level of air emissions (CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, etc.), water pollution (BOD, COD, lead, nitrates, etc.), deforestation, soil erosion, health of marine ecosystems, as well as commitment to international environmental agreements (Arvin and Lew, 2011; Bättig and Bernauer, 2009; Bernauer and Koubi, 2009; Carayannis et al., 2021; Fredriksson and Wollscheid, 2007; Hanusch, 2018; Li and Reuveny, 2006; Neumayer, 2002; Povitkina, 2018; Sjöstedt and Jagers, 2014). Most scholars find that more democracy, as a general rule, is associated with stronger environmental performance. However, comparing the results between such studies and the different indicators of environmental performance reveals some inconsistency. Recent research has also started to disentangle what aspects of democracy play a role in securing environmental protection and reports that civil society participation, public opinion, and the degree of political constraints matter (Lægreid and Povitkina, 2018; von Stein, 2022).

One of the key shortcomings of the previous empirical scholarship on the democracy-environment nexus is that the relationship between democracy and environmental outcomes appears far-fetched, because there are reasonably several other factors, originating from outside the political sphere, influencing these outcomes. It is thus more relevant to study what political regimes actually do to protect the environment – that is, adopt legislation or employ various policy instruments – rather than trying to capture potential outcomes of these political actions, such as the level of emissions.

Another important infirmity of this scholarship is the current lack of empirical account for the prescriptions elaborated by social theorists. While such theory predicts that democratic institutions can have different consequences for countries' environmental performances, depending on the ideological and other political-ethical ideals (i.e., ideals influenced by thin liberal-, social-liberal- and deliberative theory) dominating in the different democracies, to our knowledge there have been no empirical studies that distinguish between the effects of such different ideological and other political-ethical ideals or features related to them on the environment.

In this paper, we aim to address both of these shortcomings by investigating *how countries that are empirically leaning towards different ideal types of democracy actually perform in their environmental commitments*. Since the theoretical literature on the democracy-environment nexus is normative, i.e., every theorist advocating one of the three democratic models does that because they believe that their personal 'favorite model' will have the best (normative) outcome for the environment, our study is explorative. Thus, we do not (and cannot) derive any hypotheses from the theoretical literature, and chose to remain open to the patterns that we discover during this first empirical investigation.

## 4. Data and methods

### 4.1. Data

#### 4.1.1. Environmental commitments

Countries' commitments to combat environmental problems can vary on at least two dimensions: 1) level of policy stringency and 2) level of policy implementation. This is conceptually different from environmental performance, which can also include environmental outcomes. In the paper, we primarily focus on environmental commitments along these two dimensions. In our choice of measures of environmental

commitments, we used the above logic as a guide and choose all available indicators we could find freely available online. As a result, we measure the extent of countries' environmental commitments with several indicators:

First, we use data from the [Climate Change Laws of the World database \(2020\)](#) and calculate the number of laws and policies related to climate change mitigation adopted per country per year. We limit our analysis to years after 1990 when climate change issue gained visibility in preparation to the Earth Summit in 1992. Our time series stretch until 2018.

Second, as a simple count of laws and policies does not account for the quality and comprehensiveness of these laws and policies, and therefore might be a misleading indicator of environmental commitments, we also assess the effectiveness of these laws. We adopt a strategy by [Eskander and Fankhauser \(2020\)](#), and estimate reductions in carbon dioxide (CO<sub>2</sub>) emissions from national climate change mitigation legislation in democracies with different dominating features. To model this, we use democracy indicators as moderators of the effect of law count on CO<sub>2</sub> emissions and calculate conditional marginal effects. The dependent variable is CO<sub>2</sub> emission intensity measured in mega tons of CO<sub>2</sub> per unit of economic output (2011 PPP \$1 GDP), log-transformed. Just as in the article, we analyze the effect of the 'stock of recent climate change mitigation laws and policies', a rolling sum of adopted laws and policies over three-year periods until 2016. Studying the effectiveness helps us cover both stringency and implementation dimensions of environmental commitments.

Third, we use an indicator from the OECD database on the stringency of environmental policies (EPS). The index is a composite measure that aggregates market-based and non-market-based policy instruments. These policy instruments include environmental taxes on SO<sub>x</sub>, NO<sub>x</sub>, diesel, and CO<sub>2</sub>; trading schemes in CO<sub>2</sub>; renewable energy and energy efficiency certificates; feed-in tariffs on solar and wind energy; deposit and refund schemes; emission limit values on NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>x</sub>, and sulphur content limits in diesel, as well as government expenditure on research and development within renewable energy ([Botta and Koźluk, 2014](#)). Thus, the indicator taps upon the stringency dimension of environmental commitments, but not implementation. Higher scores on the index correspond to higher environmental policy stringency. The indicator is available for 34 countries in the OECD and BRIICS (Brazil, Russia, India, Indonesia, China, and South Africa) between 1990 and 2015, with gaps, but for most countries the coverage only extends until 2012.

Fourth, we explore the variation in environmental commitments in the non-OECD countries and take 'Environmental Policy' indicator from the Bertelsmann Stiftung's Transformation Index ([Donner et al., 2020](#)). The indicator is an expert evaluation of the extent to which 'environmental concerns [are] effectively taken into account' in macro- and microeconomic terms, per country per year. The indicator ranges from 1, 'Environmental concerns receive no consideration and are entirely subordinated to growth efforts. There is no environmental regulation', to 10, 'Environmental concerns are effectively taken into account and are carefully balanced with growth efforts. Environmental regulation and incentives are in place and enforced'. The indicator thus taps on both the stringency and implementation dimensions of countries' environmental commitments. For more information about the indicator construction, see [Donner et al. \(2020\)](#). The indicator covers 137 developing countries between 2006 and 2020, with a gap every second year.

#### 4.1.2. Conceptions of democracy

We cannot strictly categorize existing democracies into the different 'ideal' democracy types or models, as most countries have only developed aspects related to these types to a *certain degree*. For example, social-liberal democracies might also have some elements of the thin liberal features while at the same time having aspects of deliberation developed. This means that it is not possible to empirically categorize countries into clear 'types' – they will all possess traces of all three

models. We therefore instead measure the degree to which the thin liberal, social-liberal, and deliberative features are developed in countries, reflecting the prevalence of certain features over others.

We measure different democratic features using data from the Varieties of Democracy Project (V-Dem) on different conceptions of democracy (Coppedge et al., 2020) and the Fraser Institute's Index of Economic Freedom (2020). While the V-Dem project suggests its own indicators of liberal, social-liberal (egalitarian), and deliberative features for capturing different types of democracy (Coppedge et al., 2011), indicators measuring these features are highly correlated ( $>0.7$ , see Online Appendix F) and therefore hard to distinguish from one another in the correlational analysis. Moreover, the indicator measuring liberal features from V-Dem does not capture the strength of the market, which is emphasized as an important deterrent of environmental commitments in green political theory. For these reasons, we construct our own indices of democratic features. We still use the measurement model output for expert answers to individual survey questions from V-Dem to measure deliberative and social-liberal (egalitarian) features (Pemstein et al., 2020), but we only select the key questions to capture the theoretical arguments raised in the environmental politics literature, to minimize correlation between our indices. In order to measure thin liberal features, we only use components of the Fraser Institute's Index of Economic Freedom. We do, however, perform the analysis with V-Dem composite indicators in the Online Appendix (F).

In our baseline model, we use the Electoral Democracy Index as an indicator of a thin procedural democracy. The index is based on the conceptualization of democracy as polyarchy developed by Dahl (1971). The index includes measures of the degree to which elections are free and fair, whether suffrage is universal, whether citizens are free to express their opinions and organize in civil society organizations and political parties, and whether officials are elected through popular elections. It ranges from 0 to 1, where higher values indicate more developed electoral democracy principles.

According to existing theories, the main critique of *liberal democracy in its thin conception* lies in the relative strength of the market and the influence of business in political decision-making, as well as a commitment to strong individual liberties that prevents governments from enforcing environmentally friendly behavior on their citizens. We gauge the presence of these features using indicators from the Index of Economic Freedom from the Fraser Institute (Fraser Institute, 2020). We opted for using as many indicators that tap into individual and business freedom from government regulation as possible. The indicators we included are: the size of government, protection of property rights, freedom to own foreign currency bank accounts, tariffs on foreign trade, controls on the flow of capital, and credit market regulations. We do not integrate indicators related to regulatory quality, rule of law, and ease of doing business as they tap into features of political systems other than thin liberal ones and are further away from the aspects discussed in green political theory that we aim to capture. For this reason, the survey questions included in the measurement of liberal index from V-Dem are less useful for our main evaluation of green political theory, as they measure constraints on the executive and rule of law. For more information on the indicators, see Online Appendix A.

To capture *social-liberal features* of democracies, we use indicators that reflect inequalities within countries, including inequalities resulting in unequal access to healthcare and education, whether policies are universalistic or means-tested, and whether expenditures go towards particularistic or public goods. The indicators that we code into our social-liberal features can thus help us test if societies that strive for universal welfare also have higher environmental commitments.

We measure democracies' *deliberative features* using questions from the V-Dem dataset that gauge how wide and independent public deliberations are, whether the political elites acknowledge and respect counterarguments when making policy revisions, whether policymakers consult civil society organizations and whether the range of consultation is wide enough to include the entire political elite and 'all politically

**Table 2**  
Strategy for operationalization of different features of democracies.

Features of democracy	Operationalization
Electoral democracy (Model 1)	Electoral democracy index (V-Dem)
Thin liberal features (Model 2)	Size of government Protection of property rights Freedom to own foreign currency bank accounts Tariffs on foreign trade Capital controls Credit market regulations
Social-liberal features (Model 3)	Equality in access to healthcare Equality in access to education Spending on particularistic or public goods Means-tested or universalistic policy
Deliberative features (Model 4)	Extent of public deliberations Officials' respect for counterarguments Extent of civil society consultation Range of consultations

relevant sectors of society and business'. The indicators of deliberative features thus capture the extent of deliberation and consultation with relevant actors.

We calculate the indices of thin liberal, social-liberal, and deliberative features by conducting a series of factor analyses, extracting the factor scores using maximum likelihood estimation (mlmv in STATA). After factor analysis, the thin liberal, social-liberal, and deliberative indices are standardized and are therefore on the same scale, which makes it convenient for effect comparison. We rescale the indices to take only positive values, which is convenient for the additional calculations we do in Online Appendix D. Table 2 summarizes our strategy for the operationalization of different democracy features.

To ensure that we measure the features of *democracy* we only perform our analysis on the sample of democracies in our main analysis. We divide democratic and authoritarian regimes using the dichotomous democracy index from Bjørnskov and Rode (2020), which is an extended version of the democracy index from Cheibub, Gandhi and Vreeland (2010).

#### 4.1.3. Control variables

We make sure to control for other relevant factors that impact environmental commitments in democracies. First, we take into account countries' levels of economic development and include a value of countries' GDP per capita from the World Bank Development Indicators (2016), available through the Quality of Government Institute (Teorell et al., 2020). Higher income is often associated with higher likelihood that people have developed post-materialistic values and demand environmental policies (Inglehart and Welzel, 2005). Countries-members of the European Union have been pressured to adopt certain environmental policies, and therefore we control for the amount of time a country has been a member of the EU. Countries that are non-EU members are coded as zero. To account for the impact of international trade and economic globalization on the adoption of environmental policies, we include the measure of countries' involvement in trade from the World Bank Development Indicators (2016). We additionally include the measure of political corruption from the Varieties of Democracy project (Coppedge et al., 2020), as corruption is detrimental to the strength of environmental commitments (e.g., Povitkina and Bolkvadze, 2019). In the model with the number of laws as a dependent variable, we also control for the number of years since independence (logged), as new countries tend to adopt more laws. When including control variables, we performed multicollinearity tests and did not detect any problems.

In models inspired by Eskander and Fankhauser (2020), we use their set of independent variables instead, which includes a stock of older climate mitigation laws, rule of law, a squared term of GDP per capita, import share as a percentage of GDP, services share as a percentage of GDP, deviation from average air temperature, a cyclical component of GDP based on a Hodrick-Prescott (HP) decomposition, and a federalism

**Table 3**

The relationship between thin liberal, social-liberal, and deliberative features and the number of climate laws and policies in democracies.

DV: Climate law or policy in place	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Between-part:</b>					
Electoral democracy	0.935 (0.727)				
Thin liberal features		-0.042 (0.137)			-0.050 (0.131)
Social-liberal features			0.087 (0.142)		0.056 (0.141)
Deliberative features				0.273† (0.149)	0.278† (0.149)
Corruption	0.668† (0.386)	0.378 (0.353)	0.493 (0.410)	0.676† (0.374)	0.738† (0.428)
<b>Within-part:</b>					
Electoral democracy	1.763† (1.017)				
Thin liberal features		0.144 (0.130)			0.129 (0.131)
Social-liberal features			-0.057 (0.405)		-0.066 (0.422)
Deliberative features				0.245 (0.186)	0.230 (0.188)
Corruption	1.410† (0.739)	0.634 (0.583)	0.578 (0.570)	1.244 (0.760)	1.200 (0.756)
Constant	-4.125*** (1.233)	-3.316** (1.278)	-3.716** (1.435)	-4.179** (1.377)	-4.357** (1.528)
Observations	2,304	2,304	2,304	2,304	2,304
Number of countries	105	105	105	105	105
Additional control variables	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes
AIC	3299	3304	3305	<b>3299</b>	3306

Within-between Poisson regression of the number of climate change mitigation laws and policies on different democracy features. Robust clustered standard errors in parentheses, \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05, † p < 0.1. The sample is limited to democracies as classified by Bjørnskov and Rode (2020). All models control for ln GDP per capita, ln trade openness, time in the EU, corruption, and ln independence years. All independent variables in the within-part are lagged 1 year apart from ln independence years.

dummy. For the list of sources and methodology, see Eskander and Fankhauser (2020).

4.2. Model

In this exploratory analysis, we are interested in estimating if there are substantial differences in environmental commitments *between* democracies depending on the features that prevail, but also whether developments in any of the features *within* democracies over time have any association with the change in their environmental commitments. We therefore, utilize time-series data whenever possible.

When we use the number of laws and policies adopted per country per year as a dependent variable, we estimate the within-between effects Poisson model with clustered standard errors per country, following a strategy suggested by Bell and Jones (2015) for linear regressions. In doing this, we include both country means of the variables and variable

**Table 4**

The relationship between thin liberal, social-liberal, and deliberative features and the effectiveness of climate laws in democracies.

DV: ln CO2 emission intensity	Model 1	Model 2	Model 3	Model 4
Electoral democracy	0.023 (0.104)			
Stock of recent mit. laws*Elect. dem	-0.004 (0.020)			
Thin liberal features		-0.032† (0.019)		
Stock of recent mit. laws*Thin liberal		-0.010† (0.005)		
Social-liberal features			0.110 (0.067)	
Stock of recent mit. laws*Soc-liberal			-0.006† (0.003)	
Deliberative features				-0.017 (0.027)
Stock of recent mit. laws*Deliberative				0.007 (0.005)
Stock of recent mitigation laws	-0.005 (0.017)	0.030 (0.020)	0.013 (0.012)	-0.033 (0.022)
Constant	-7.614* (2.929)	-8.114** (2.769)	-7.180* (2.874)	-7.803** (2.848)
Observations	1,480	1,480	1,480	1,480
R-squared	0.532	<b>0.540</b>	<b>0.540</b>	0.534
Number of countries	94	94	94	94
Additional control variables	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes

OLS regression of a natural logarithm of CO2 emissions per 2011 PPP \$1 GDP on the interaction effect between the stock of recent climate change mitigation laws and different democracy features, with country and year fixed effects. The sample is limited to democracies as classified by Bjørnskov and Rode (2020). The regressions control for the stock of older climate mitigation laws, rule of law, GDP HP filter, squared term of GDP per capita (natural log), the size of imports and services as a percentage of GDP, difference between the yearly average temperature and the long term (1980–2015) average temperature, and federalism. Robust standard errors in parentheses, \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05, † p < 0.1. All independent variables are lagged 1 year.

deviations from their means to obtain estimates for both within- and between-country variation. We also include year fixed effects to control for common intertemporal trends across countries.

When investigating the effectiveness of environmental laws in democracies with different features using a strategy by Eskander and Fankhauser (2020), we estimate the OLS regression with country and year fixed effects and an interaction term between our democracy features and the stock of recent climate mitigation laws.

When examining the relationship between the different democracy features and the environmental policy stringency index among OECD democracies and the environmental sustainability efforts among developing democracies, we estimate the within-between effects linear model (Bell and Jones, 2015), also with year fixed effects, as in the models with the number of laws and policies as the dependent variable.

We conduct the analysis for the sample of democracies only, to explore how thin liberal, social-liberal, and deliberative features correlate with environmental commitments specifically among democracies. We compare the performance of democracies with different features by comparing the size of their coefficients, as they are on the same scale, whether the coefficients are statistically significant, as well as the model fit statistics (R<sup>2</sup> or AIC).

5. Results

The results of our model estimations with different dependent

**Table 5**

The relationship between thin liberal, social-liberal, and deliberative features and environmental policy stringency in the democracies of OECD and BRIICS.

DV: EPS	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Between part:</b>					
Electoral democracy	0.514 (1.355)				
Thin liberal features		0.228† (0.136)			0.219 (0.143)
Social-liberal features			0.377*** (0.102)		0.305*** (0.086)
Deliberative features				0.253 (0.201)	0.288† (0.175)
Corruption	-1.914** (0.725)	-1.768*** (0.319)	-1.226*** (0.318)	-1.570*** (0.351)	-0.721* (0.309)
<b>Within part:</b>					
Electoral democracy	1.028 (1.144)				
Thin liberal features		0.008 (0.187)			0.028 (0.154)
Social-liberal features			0.309 (0.322)		0.396 (0.301)
Deliberative features				-0.584* (0.290)	-0.609* (0.298)
Corruption	-1.451 (1.301)	-1.811 (1.124)	-1.558 (1.056)	-3.705** (1.176)	-3.390** (1.224)
Constant	0.702 (1.290)	0.370 (0.391)	-0.368 (0.418)	0.111 (0.733)	-1.948† (1.029)
Observations	671	671	671	671	671
R <sup>2</sup> between	0.613	0.626	0.702	0.624	0.708
R <sup>2</sup> within	0.808	0.807	0.808	0.819	0.821
Number of countries	31	31	31	31	31
Year fixed effects	yes	yes	yes	yes	yes

Within-between regression of environmental policy stringency on different democracy features with year fixed effects in the OECD and BRIICS. The sample is limited to democracies as classified by Bjørnskov and Rode (2020). Both within- and between-parts of the equation include controls for the GDP per capita (natural log), trade openness, time in the EU, and corruption. Robust standard errors in parentheses, \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05, † p < 0.1. All independent variables are lagged 1 year.

variables are presented in Tables 3–6. Table 3 summarizes the results from the within-between Poisson regression of the number of adopted climate change mitigation laws and policies adopted on various features of democracies. Model 1 presents the relationship between the electoral democracy index and the number of adopted laws and policies. Models 2–4 – the relationship between thin liberal, social-liberal, and deliberative features respectively, while Model 5 shows the results when all three indices are included in one model, testing whether one of them is a stronger predictor than the rest. The table is divided into two parts. The upper part contains coefficients from the between-analysis that shows the relationship *between* democracies, while the lower part of the table contains the coefficients from the analysis of variation *within* democracies, based on changes over time.

The results show a positive statistically significant relationship between the level of electoral democracy and the number of climate change mitigation laws and policies in the within-part of the analysis, implying that as countries become more democratic, they tend to adopt more laws and policies related to climate change mitigation. There is also a positive significant relationship between deliberative features and the number of climate change mitigation laws and policies in the between-part, implying that democracies with more developed deliberative features tend to adopt more climate laws and policies than democracies where deliberative features are less developed.

Notably, the results also show a positive significant relationship between the level of corruption and the number of laws and policies: countries with higher corruption tend to adopt more laws. This finding is interesting but not surprising – corrupt regimes might adopt more laws as a tool to improve their reputation on the international arena. In light of these findings, it is relevant to look at the effectiveness of these climate mitigation laws, to gain a more complete understanding of the role of democracy features in national environmental politics.

Table 4 summarizes the results from models inspired by Eskander

and Fankhauser (2020), a country-year fixed-effects estimation of the effect of the stock of recent climate laws on CO<sub>2</sub> emission intensity. We added an interaction term between ‘the stock of laws for the latest three years’ and the different features of democracy to estimate the effect of the stock of laws on CO<sub>2</sub> emission intensity, depending on the prevalent democratic feature. Model 1 presents the results for the interaction effect between the electoral democracy index and the number of laws, Model 2 – between thin liberal features and the number of laws, Model 3 – between social-liberal features and the number of laws, and Model 4 – between deliberative features and the number of laws.

The results are statistically significant for the models with thin liberal and social-liberal features, which implies that it is relevant to explore these interaction effects further. We further build conditional marginal effects plots to compare the relationship between the stock of recent climate laws and CO<sub>2</sub> emission intensity in democracies with different features.

The conditional marginal effects plots, presented in Fig. 1, show that the strongest effect from the stock of recent climate laws on CO<sub>2</sub> emission intensity, represented by a steeper slope, is among the democracies with more pronounced thin liberal and social-liberal features. This implies that as countries develop more liberal (in its thin conception) and social-liberal features they also tend to be more successful in translating their climate laws into the reduction of CO<sub>2</sub> emission intensity. Development of the deliberative democracy features does not play a role in determining whether the adopted climate laws mean a reduction in CO<sub>2</sub> emissions. This is a notable finding given that deliberative democracies tend to adopt more laws and policies, as shown in Table 3.

Table 5 presents the models, where the dependent variable is the Environmental Policy Stringency Index from the OECD database. The sample covers OECD and BRIICS countries. The presentation of the results follows a similar logic as in Table 3. The results show that democracies with more pronounced liberal (in its thin conception) and

**Table 6**  
The relationship between thin liberal, social-liberal, and deliberative features and environmental efforts in developing countries.

DV: Environmental efforts	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Between part:</b>					
Electoral democracy	0.687 (1.174)				
Thin liberal features		0.022 (0.230)			0.088 (0.208)
Social-liberal features			0.390† (0.206)		0.409* (0.204)
Deliberative features				0.054 (0.281)	0.055 (0.273)
Corruption	-1.810* (0.715)	-2.034** (0.638)	-1.548* (0.680)	-1.963** (0.691)	-1.436† (0.762)
<b>Within part:</b>					
Electoral democracy	1.120 (0.849)				
Thin liberal features		0.092 (0.173)			0.095 (0.170)
Social-liberal features			0.291 (0.359)		0.313 (0.374)
Deliberative features				-0.043 (0.153)	-0.051 (0.157)
Corruption	-0.984 (0.878)	-1.537† (0.923)	-1.471 (0.915)	-1.609† (0.975)	-1.597† (0.966)
Constant	3.325† (1.752)	4.057*** (1.036)	3.682*** (1.063)	3.840* (1.743)	3.215† (1.817)
Observations	415	415	415	415	415
R <sup>2</sup> between	0.705	0.700	<b>0.714</b>	0.699	0.714
R <sup>2</sup> within	0.086	0.080	0.083	0.081	0.084
Number of countries	69	69	69	69	69
Year fixed effects	yes	yes	yes	yes	yes

Within-between regression of ‘environmental efforts’ in the developing world on different democracy features, with year fixed effects. The sample is limited to democracies as classified by Bjørnskov and Rode (2020). Both within- and between-parts of the equation include controls for the GDP per capita (natural log), trade openness, time in the EU, and corruption. Robust standard errors in parentheses, \*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05, † p < 0.1. All independent variables are lagged 1 year.

social-liberal features have higher environmental policy stringency than democracies with less pronounced thin liberal and social-liberal features. The coefficient on the social-liberal index is higher, implying that its effect on environmental policy stringency is stronger. When all three democracy features are included in one model for comparison, democracies with pronounced social-liberal and deliberative features have significant coefficients; however, the social-liberal index still has the largest effect size, implying that democracies with prevalent social-liberal features have higher environmental policy stringency than democracies with other dominating features.

The results for the analysis of changes within countries show that developments towards higher deliberation are actually associated with negative trends in environmental policy stringency. This implies that there might be a negative relationship between deliberation and environmental policy stringency. This result holds even when all three indices are included in one model for comparison.

The coefficients for all control variables are in the expected direction. What particularly stands out is the strong negative association between corruption and environmental policy stringency, both in the within- and the between- analysis, implying that countries with higher corruption

have lower environmental policy stringency and an increase in corruption levels is associated with a decrease in environmental policy stringency.

Table 6 presents the results for the relationship between the different democracy features and a measure of ‘environmental efforts’ in the developing countries from the Bertelsmann Stiftung’s Transformation Index. The comparison of the coefficients for the different democracy features indicates that social-liberal features have the strongest association with environmental efforts among developing countries, and that the social-liberal index is the only one significant. Moreover, the between-model with the social-liberal index as a predictor has the largest R<sup>2</sup>. When all three indices are included in one model (Model 5), the social-liberal index is also the only one that has a statistically significant coefficient, implying that democracies with strong traces of social-liberal features make greater environmental efforts than other democracies in the developing world. In the within-sample, the results are insignificant. Among the control variables, corruption, again, appears to be a strong negative predictor of environmental efforts. Table 7 summarizes our main findings for all four indicators of environmental commitments.

In addition, we implemented a number of alternative model specifications: First, we compared the environmental commitments of democracies with thin liberal, social-liberal, and deliberative features with environmental commitments of authoritarian regimes, and performed the same sets of models as in the main analysis but for the full sample of countries, multiplying our indicators with a democracy dummy from Bjørnskov and Rode (2020). Second, we investigated whether arguments brought up in the green political theory literature apply to non-democracies, that is, whether thin liberal, social-liberal and deliberative features play a role when we compare all countries regardless of their regime type. Third, we used indicators of liberal, social-liberal (egalitarian), and deliberative features from V-Dem as independent variables instead of our own indices. V-Dem’s operationalization of liberal features is based on a thicker understanding of liberal democracy and includes a rule of law indicator, as advocated for by general political theory. Comparing the results from this analysis to the analysis with our index of thin liberal features, which is based on market freedom, helps us scrutinize the arguments brought up in green political theory more thoroughly. It helps us infer whether some of the green political theorists were indeed underestimating the liberal democratic model in its ability to establish environmental commitments by not giving enough credit to the benefits of rule of law. The results from all these three extensions of our analysis are presented in Online Appendices D-F and are similar to the results we obtained in the main analysis - social-liberal features have the strongest and most robust association with environmental commitments out of the three features, while deliberative features have the weakest association if any. The positive significant association with the number of climate change mitigation laws and policies and negative significant association with environmental policy stringency for the OECD-BRIICS sample remained robust, calling for further analysis. Surprisingly, we did not find a positive effect of liberal features with rule of law included in the coding on the extent of environmental commitments. Instead, social-liberal (egalitarian) features remained the strongest predictor among the three features.

## 6. Discussion and conclusions

The aim of this study has been to investigate how countries that are (empirically) more or less associated with different democracy ideals perform in terms of their environmental commitments. Taking as a point of departure the theories on how the dominance of liberal values, in their thin interpretation, social-liberal traditions, and deliberative practices can influence the environmental commitments of democracies, we scrutinize green political theoretical scholarship and put a number of established theoretical arguments to an empirical test.

The results generally speak in favor of democracy with pronounced



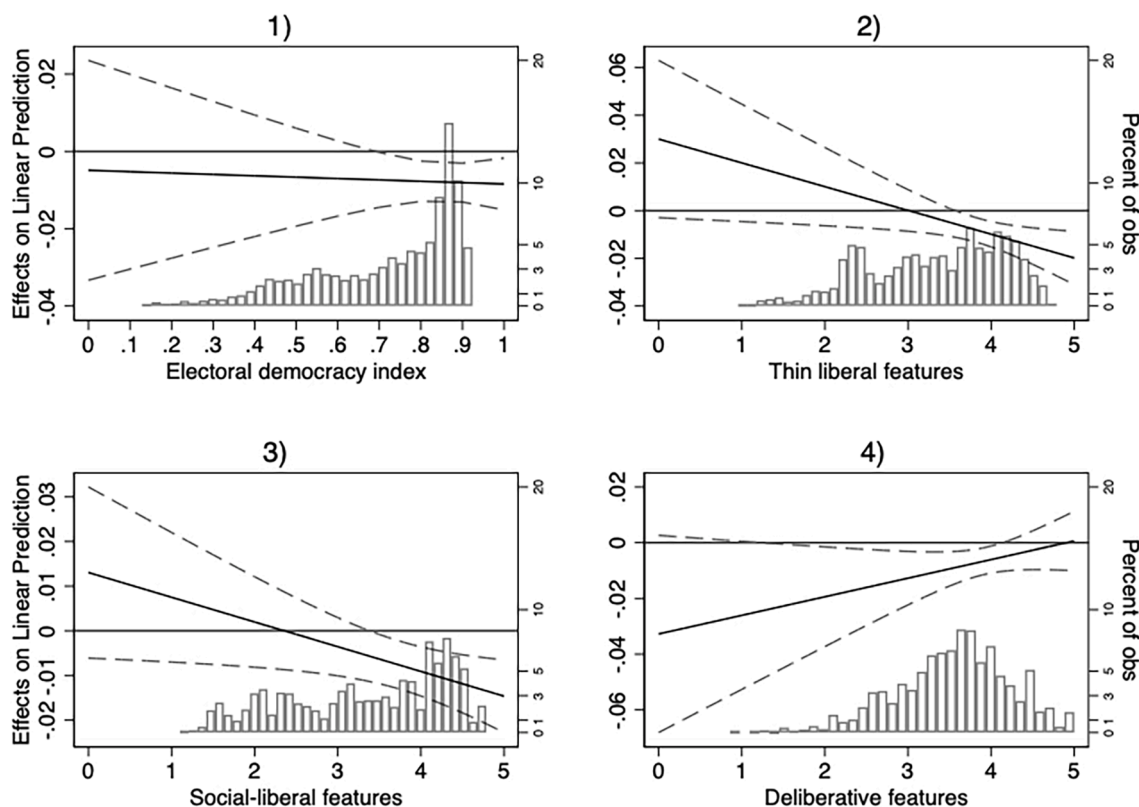


Fig. 1. Marginal effects of the stock of recent climate change mitigation laws on CO<sub>2</sub> emissions conditional on the level of electoral democracy (1), extent of thin liberal features (2), social-liberal features (3), and deliberative features (4) in democracies, with 90% confidence intervals.

Table 7

Summary of the results in the sample of democracies.

	Measures of environmental commitments			
	Number of climate laws and policies	Effectiveness of climate change mitigation laws	Environmental policy stringency	Environmental efforts
Sample	<i>all democracies</i>	<i>all democracies</i>	<i>democracies in OECD&amp;BRIICS</i>	<i>developing democracies</i>
Thin liberal features	Null	Positive	Null	Null
Social-liberal features	Null	Positive	Positive	Positive
Deliberative features	Positive	Null	Negative	Null

social-liberal features. First, democracies with social-liberal features translate climate mitigation laws and policies into CO<sub>2</sub> emission reductions. Second, at least among the OECD-BRIIC countries, democracies with pronounced social-liberal features have significantly higher environmental policy stringency than democracies where these features are less pronounced. Third, democracies with social-liberal features in the developing world also make greater environmental efforts than the rest. This implies that countries that carry out social-liberal politics, which results in higher equality among citizens in their access to public services such as healthcare and education, the prevalence of universalistic over means-tested policies, and higher spending on public rather than particularistic goods, tend to also adopt more stringent environmental policies, possibly as an example of such universalistic policies, compared to countries leaning towards any of the other ideals that we examine. Remarkably, this result is not driven by the exceptional social-liberal traditions of Northern Europe, but is also true for countries in the developing world.

The development of thin liberal features in democracies has just as strong an association with CO<sub>2</sub> emission reductions following the adoption of climate laws and policies as the development of social-liberal features. This might imply that market-based policy instruments, usually applied in democracies with strong markets, might be

as effective in reducing greenhouse gas emissions as taxes, usually used by democracies following a more social-liberal model. However, this insight needs further investigation before more definite conclusions can be drawn, especially given that policy instruments are now increasingly applied in policy packages rather than separately (Wicki et al., 2020) and are being adopted in an increasing number of countries, not all of which can be characterized as social-liberal. At the same time, thin liberal features do not have an association with any other measures of environmental commitments. We expected that this could be attributed to the fact that our operationalization of thin liberal features did not include the rule of law indicator and therefore performed an additional investigation of a ‘thicker’ measure of liberal features that included the rule of law in the coding. However, the results remained robust with no indication of a positive relationship between liberal democratic features and environmental commitments.

Finally, we find that deliberative features have the weakest association with environmental commitments among the three democracy features investigated in the paper. This is worth reflecting on a bit further. The results, for example, show that democracies with deliberative features tend to adopt a higher number of laws and policies related to climate change mitigation. As it seems, however, these laws are not successfully translated into the reduction of CO<sub>2</sub> emissions, at least not

quickly enough to be visible in our analysis, as in the case of democracies with thin liberal or social liberal features. In addition, despite the fact that deliberative democracies tend to produce more climate laws, deliberative features are not associated with higher environmental policy stringency (which includes stringency of climate policies). Our models even show that development in deliberation is associated with a *decrease* in environmental policy stringency among the OECD-BRIIC democracies. These results are interesting since they go against the prediction of green political theories advocating deliberative democracy as an effective system for producing solutions to environmental problems.

Our results invite for future, both theoretical and empirical, research. Not the least is it important to further theorize, and ideally also empirically test, what might be the mechanisms apparently weakening the previously reported positive relationship between deliberative democracy and environmental commitments (e.g., in several contributions in Bäckstrand et al., 2010; Niemeyer, 2013). For example, it could be worthwhile analyzing if countries that open up channels for deliberation not only enable pro-environmental interests to join forces, but in parallel also help giving voice to more anti-environmental interests, which (under certain conditions) might in fact trump the pro-environmental interests. In addition, it could be that different types of democracy provide channels for facilitating different types of environmental policies. While thin liberal and social-liberal features are more suitable for emission mitigation policies, deliberation could be beneficial for policies related to adaptation to environmental problems (Ayers, 2011), a category of environmental commitments that we do not investigate in this paper. Moreover, while there are empirical examples of countries with particularly pronounced social-liberal features (Nordic countries) and thin liberal features (the United States and the United Kingdom), the examples of countries with pronounced deliberative practices, properly understood as deliberative democracies in political theory, are much harder to find. Therefore, it could be that the lack of effect from deliberation is driven by the fact that no country has so far reached a deliberative democratic ideal. Furthermore, much of previous empirical research on deliberative democracy has often focused on a single or few cases. Our large-N investigation challenges these individual case studies by controlling for other important determinants of national environmental performance, including other democracy features. Therefore, our findings hint that the effectiveness of deliberation processes specifically for the stringency of environmental policies on the national level should be further scrutinized. Our analyses also generate some implications for green political theory and the pronounced criticism of thin liberal democracy over the years. It shows that democracies that develop the thin liberal features criticized in the literature, do not perform significantly worse than the rest, and in fact exhibit comparable results to those of democracies with social-liberal features when it comes to, for example, reducing carbon emission intensity.

Finally, another limitation of the existing theories is that they, by only focusing on *democracy* features, overlook the importance of the factors that they discuss in reference to non-democratic regimes. However, their arguments are also relevant for understanding environmental commitments in non-democracies. In fact, our analysis shows that a more social-liberal politics is beneficial for countries' environmental commitments regardless of the regime type.

Future research should continue testing the relationship between both the democratic models outlined in this article, as well as (if possible to make operational) more recently developed and often topic-oriented democratic models (e.g., carbon and energy democracy), and various measures of environmental commitment as more data becomes available. Another route forward is to see how the various democracy models correlate with countries' environmental performance. Finally, using process tracing approaches, future studies can also investigate—more qualitatively—*how* the hypothesized effect of liberal, social-liberal, and deliberative features have played out for the environmental commitments of countries that practiced these types of democratic politics.

## CRediT authorship contribution statement

**Marina Povitkina:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing.  
**Sverker Carlsson Jagers:** Conceptualization, Writing – original draft, Writing – review & editing.

## 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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## Appendix A. Supplementary data

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