**Political economic constraints to climate policy: literature, a framework and stylized facts**

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Policy prescriptions for climate change mitigation often overlook fundamental constraints to their promotion and adoption. Institutions can lack the capabilities to formulate and apply regulations. Social and cultural ideas can lower trust in public policy making, or disregard the impacts and proximity of climate change, severely limiting opportunities for change. Above all, interest groups actively deploy financial and political power to minimise compliance costs, while shaping ideas and institutions to further consolidate their position. These complex political economic constraints to climate policy have to date been scarce researched. In this paper we review the empirical and theoretical literature relevant for understanding cross-national differences in the adoption and outcomes of climate legislation and policies. We then present a series of stylized facts in order to answer the question - *which countries are severely exposed to political economic constraints to climate policy, and do they matter for global climate mitigation?*

## Introduction

It is largely acknowledged that countries are not on track to meet the climate mitigation goals of the Paris Agreement. Assessments of the Nationally Determined Contributions (NDCs) point to a global emissions pathway that far exceeds the cumulative emissions budget of the 2°C goal, let alone 1.5°C (UNEP, 2018). A majority of countries have put into place climate targets and legislative measures (Iacobuta, Dubash, Upadhyaya, Deribe, & Höhne, 2018), but the implementation of effective and stringent policies is still lacking (Carbon Pricing Leadership Coalition, 2017). Fossil fuels remain a mainstay of the global economy and emissions are once again on the rise (Quéré et al., 2018).

One prominent explanation for the climate gridlock is that a top-down global agreement on burden sharing, technological transfers and finance is required (REFs?). In its absence, countries – motivated by their business communities and electorates – choose instead to minimise costs and ‘freeride’ on the actions of others, resulting in piecemeal actions that add up to little substantive effort. Evidence for these claims can be found in the consistent lack of progress made in international climate negotiations, up until the bottom-up voluntary pledge system manifested in Paris.

Another line of explanation puts the blame on intrinsic human characteristics. It is argued that we are uniquely unsuited to perceiving the proximity and severity of climate change (Gifford, 2011) and addressing the ethical and socio-temporal difficulties it presents, such as the need to shoulder the costs of mitigation on behalf of distant victims and future generations (Gardiner, 2011). A ‘perfect moral storm’ locks society and its institutions into inaction.

A third avenue focuses on social and infrastructural sources of carbon ‘lock-in’. Since most fossil emitting or shaping infrastructures (e.g. power plants, urban form) have long lifetimes, sunk costs, and socially embedded patterns of use that are by now ‘normal’, energy systems have built-in sources of inertia that severely constrain the speed and ambition of transitions (Ivanova et al., 2018; Seto et al., 2016).

To date, political economic explanations for the climate gridlock have received much less attention than these three (valid and important) lines of research. In this view, shifts away from fossil fuels and energy-intensive activities are seen through a lens of power and conflict between interest groups (Fuchs et al., 2015; Geels, Sovacool, Schwanen, & Sorrell, 2017; Grandin, Haarstad, Kjærås, & Bouzarovski, 2018; Lockwood, Kuzemko, Mitchell, & Hoggett, 2016; Moe, 2010; Roberts et al., 2018). Fossil fuel interests are central to the analysis: strong climate policy poses an existential threat to their standard operating practices, and they will mobilise vast financial and political resources to prevent it. Such strategies may include political lobbying, shaping public discourses against climate action, or ‘capturing’ the very government bodies that are tasked with their regulation. The history and trajectory of political institutions and societal norms and ideas are also considered to matter, often because they facilitate and entrench the power of incumbent interests. For political economists, sources of carbon lock-in and social inertia are not accidents of modern society – they are design features of the fossil economy.

The political economy literature on climate policy has taken several directions. Strands of theoretical literature have explored the conditions and contexts that support (or hinder) energy or climate transitions (Geels et al., 2017; Gough, 2016; Moe, 2010). Within these, institutions are argued to have a central role in mediating the power of interest groups and locking-in technology systems (Lockwood et al., 2016; Meckling & Nahm, 2018). There has been much attention on the appropriate design of climate policies to overcome political constraints, for instance by compensating interest groups, or recycling carbon tax revenues into public goods to engineer social support (Spencer et al., 2018; Vogt-Schilb & Hallegatte, 2017). There has also been a series of studies on the cross-national political economic determinants of climate legislation and policy adoption (Dolphin, Pollitt, & Newbery, 2016; Fankhauser, Gennaioli, & Collins, 2015).

In this article we contribute to the latter stream of work, exploring trends that manifest at a national level and point to substantive international divergences in the prospects for rapidly mitigating climate change. We adopt the language of ‘constraints’ to describe social, political and institutional contexts that appear to hinder climate policy adoption[[1]](#footnote-1). We aim to answer the question – *which countries are exposed to political economic constraints to climate policy?* – via the following four objectives:

* Review the empirical literature identifying political, social and institutional constraints to climate legislation and policy adoption
* Synthesise the empirical literature under a political economic framework
* Construct an international dataset of indicators and report stylized facts on the international distribution of constraints, trends over time, and structurally correlating constraints
* Examine the overlap between constrained national contexts, available fossil reserves and other bottlenecks in global climate mitigation

The primary focus of analysis is on broadly acknowledged issues such as fossil rent seeking, poor institutional quality, and social fragmentation. Given the known geographic distribution of fossil fuel reserves (McGlade & Ekins, 2015) and planned carbon emitting infrastructures (Davis & Socolow, 2014; Edenhofer, Steckel, Jakob, & Bertram, 2018), we argue that assessments of future climate mitigation prospects (or ‘feasibility’) should begin with the stylized facts: what national-level constraints can be identified, where do they occur, and how are they interrelated? Due to this broad scope, our approach is complementary to, but goes somewhat against the grain of political economic research that has thus far tended to work with detailed case studies, or mid-range theories in a small number of comparative settings (Ylä-Anttila et al., 2018).

Our article is structured as follows. First (section 2) we summarise the main strands of this discussion in the climate change assessment literature, before discussing two theoretical issues: what frameworks can characterise constraints, and how should the dependent variable be defined. This is followed by our main review of the theory and empirics on climate policy constraints, focusing on the international comparative literature (section 3). Finally…

## Background and theoretical setting

How does the assessment literature on climate change mitigation address political economic constraints to climate policy? This is a useful starting point, as it points to the emergence of the issue in recent years, as well as on-going confusion as to how to define the problem and structure its components.

In the early assessment literature, there was surprisingly little discussion. The Intergovernmental Panel on Climate Change (IPCC) reports have traditionally discussed ‘enabling environments’ or ‘enabling conditions’: terms coined by the UNFCCC (2001) to promote the removal of barriers to upscaling ‘environmentally sound technologies’. In AR5, reference to enabling environments is sparse, but largely focused on technology policy and the macroeconomic context. Constraints are conceived of as institutional in nature (e.g. systems of formal and informal rules that determine the playing field for competition), involving social norms and preferences (e.g. consumer demand for low-carbon technologies), or financial considerations (e.g. tax regimes, labour markets) (Gupta et al., 2014; Kolstad et al., 2014; Somanthan et al., 2014).

The recent IPCC Special Report on 1.5°C reframes enabling conditions as an issue of ‘feasibility’. This is highlighted as a core concept in Cross-Chapter Box 3 (Allen et al., 2018), followed by extensive discussion in the Chapter 4 section titled ‘Enabling Rapid and Far-Reaching Change’ (Conick et al., 2018). Several key issues are reviewed: the role of coordinated multi-level governance in strengthening policy implementation and outcomes; the need to establish institutional capacities such as monitoring, legal frameworks and consultation methods; the importance of public awareness and support; and the potentially adverse distributional consequences of climate policy implementation (Conick et al., 2018).

Recent UNEP Emissions Gap Reports have also given political economic issues a more prominent position, notably in chapters on the phase-out of coal (UNEP, 2017) and fiscal reforms for a low-carbon transition (UNEP, 2018). Again, these underline the need to ensure an equitable distribution of costs, the importance of public support and trust in policy processes, and the likely need to compensate affected industries, regions and workers due to stranded assets and the loss of income.

[Paragraph on the SSPS, which now flank IPCC analysis]

Overall, the assessment literature provides an unclear picture of political economic constraints, for several reasons. First, no theoretical frameworks are put forth to provide a structure on which to identify and discuss different constraints. Second, the dependent variable at hand is not always clear: are these constraints to climate legislation, policy adoption, policy stringency, or policy outcomes?

### Political economic frameworks to characterise constraints

Hall (1997) argues that political economy analysis can be broadly categorised into approaches focusing on interests, ideas, or institutions. Interest-based analysis recognises that social and political change has material (e.g. monetary) consequences for different actors, such as workers, capitalists, and political agents. Material interests may intersect, stimulating the formation of actor coalitions to push for a common agenda; or they may diverge, resulting in political conflict and struggles over scarce resources. The socio-technical transitions literature argues that industrial interests are often associated with particular technologies (Geels & Schot, 2007). The conflict between incumbent fossil fuel energy producers versus ‘niche’ renewable energy-based entrants is therefore highlighted as a contemporary example of interest-based struggles that spill over into political pressure to block climate reform (Moe, 2015).

Institution-based analysis usually focuses on the organisation and functions of the nation state. In most political economy traditions the state is seen to have a central role in facilitating markets and capital accumulation, namely through the enforcement of contracts and property rights, socialising the costs of unprofitable ventures required for private enterprise (roads, education, public health), and directly facilitating economic activity (Heilbroner, 1985). Both the quality of the institutions that carry out these tasks (i.e. their technical and bureaucratic capability) and their different organisational forms (e.g. exposure to veto players or political cycles) are highly consequential for understanding the constraints to structural change (Lockwood et al., 2016; Roberts et al., 2018).

Idea-based analysis argues that the underlying worldviews and ideologies of actors matter. Certain worldviews can undermine political consensus on important points of policy, such as a pre-disposition towards rationalising the status quo (Jost, Banaji, & Nosek, 2004), or an increasing distrust of ‘elites’ such as scientists and politicians (Lockwood, 2018). But beyond the voting public, the ideas of influential actors (e.g. business leaders and politicians) are argued to be highly consequential for social and political change, since they can be directly implemented into policy (Hall, 1997). The volumes of literature on a post-1980s neoliberal turn in global governance – and its wide-reaching social, economic and political consequences – attests to this claim (Harvey, 2005; Rodrik & World Bank, 2006).

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|  | **Analytical focus** | **Influence on climate policy** |
| **Interests** | Power resources and motives of collective actors, such as industrial associations, political parties, class movements, NGOs | Powerful interests determine – within an institutional setting – the priority order for policies, or shape the possibility space for reform by deploying veto powers |
| **Institutions** | Organisation and functions of public policy making bodies, e.g. the nation state | Institutions mediate the distribution of power resources among interests, the channels for promoting ideas (e.g. via media and education), and the quality of policy implementation |
| **Ideas** | Content claims and narratives embedded in social, political and cultural discourses | Ideas with a wide reach shape the underlying worldviews of key interests and the public, regarding the need for (and possibility of achieving) reform |

Table 1: A simplified categorisation of political economy influences on climate policy

Political economists often argue that ideas, institutions and interests interact in a complex manner, potentially fusing into ‘structures’, ‘complexes’ or ‘regimes’ that are internally consistent and self-reinforcing (Geels et al., 2017). A historical perspective is needed to explore the development of these regimes, for instance to uncover how interests have engaged in shaping institutions and propagating discourses in order to consolidate their material position. The dominance of private automobile transport in many countries is one example, itself the result of decades of sunk investment in infrastructure (roads, refineries), facilitating institutions (transportation ministries), cultural conditioning (cars as a symbol of freedom and status), and material production supporting a wide array of actors (capitalists, unions, and regional economies) (REF Mattioli et al.). The ‘ways of doing things’ that are established by regimes may be so embedded in daily life as to appear a natural social phenomenon, with alternatives rarely discussed or simply deemed ‘infeasible’. Dismantling regimes is a very difficult task.

### Defining the dependent variable

Much confusion regarding political economic constraints can be traced to the dependent variable problem: what is the measure or success, or failure, in climate policy? Following two decades of climate policy making, there are various examples of target setting, treaty ratification, policy adoption, and policy outcomes (e.g. emissions trends) to assess, each with their own issues and implications.

One approach is to examine trends in national carbon emissions. This is taken by a large volume of well-reviewed studies that aim to uncover the ‘human drivers of carbon emissions’, including political economy determinants (Dietz, 2017; Jorgenson et al., 2018; Rosa & Dietz, 2012; Tjernström & Tietenberg, 2008). An advantage is the long and consistent time series of emissions accounts available (Quéré et al., 2018), facilitating quantitative assessments into the influence of various factors. A disadvantage is that current emissions are often the outcome of path dependencies that significantly pre-date contemporary climate concerns, such as early decisions that shape the fuel content of national energy systems (Foxon, Pearson, Arapostathis, Carlsson-Hyslop, & Thornton, 2013), or global trends in the distribution of manufacturing activities (Peters, Minx, Weber, & Edenhofer, 2011). For these reasons, recent trends in emissions are unlikely to be a sound guide to future constraints to climate policy making.

A second option is to examine the adoption of climate targets, legislation and international agreements. These intentions to mitigate might include the Nationally Determined Contributions (NDCs: the bottom-up climate commitments by countries to the Paris Agreement), compilations of national targets and legislative measures (Iacobuta et al., 2018), or the commitments of countries to UNFCCC protocols (Bernauer & Böhmelt, 2013). The large variation in country commitments and different types of strategies adopted (e.g. legislation vs. executive targets) attests to the interesting nature of these data. Yet, a clear disadvantage is that intentions often do not reflect outcomes. Ambitious target setting can be a form of ‘symbolic meta-policy’ that serves political goals, but does not manifest in concrete instruments and actions that lead to reduced emissions (Bache, Reardon, Bartle, Flinders, & Marsden, 2015).[[2]](#footnote-2) This is increasingly clear from countries with ambitious targets, such as Germany, but a poor track record of making progress towards them (Meckling & Nahm, 2018).

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| **Dependent variable** | **Description** |  | **Example data sources** |
| **Climate legislation** | The ratification of climate treaties (e.g. the Kyoto Protocol, Paris Agreement); setting of climate targets (e.g. Nationally Determined Contributions); adoption of legislation (e.g. UK Climate Change Act 2008); creation of responsible ministries |  | CLIMI (Steves & Teytelboym, 2013) |
| **Climate policy adoption** | The adoption of regulations, standards and instruments that support renewable energy technologies or penalise fossil fuel use (feed-in-tariffs, carbon tax, emissions trading schemes, coal moratoria, subsidy reform) |  | World Bank Carbon Pricing Dashboard (World Bank, 2019) |
| **Policy stringency** | The scope and strength of policies adopted (e.g. the emissions covered by a carbon tax, and the price level of the tax) |  |  |
| **Policy outcomes** | Composite indicators of climate policy adoption, emissions trends and renewable energy technology adoption |  | CCPI (Burck, Hagen, Marten, Höhne, & Bals, 2019) |

Table 2: Dependent variables of climate policy

A third approach is to examine the adoption and stringency of climate policies, particularly ‘flagship’ policies such as carbon taxes, renewable energy tariffs, fossil fuel subsidy reforms, or moratoria on new fossil fuel infrastructure (Compston & Bailey, 2016; Schmidt & Fleig, 2018). For some instruments this has the advantage of enabling assessments of both policy output (adoption) and outcomes (e.g. carbon price levels). However, the variety and variability of policy instruments clearly hampers comparative research.

A final approach is to combine policy output and emissions outcomes. The Germanwatch Climate Change Performance Index (CCPI) combines measures of national and international climate policy adoption with recent trends and levels of GHG emissions, energy use and renewable energy penetration (Burck et al., 2019). Extended Kaya decompositions have also been suggested, but not operationalised (Peters et al., 2017). These types of assessments are highly dependent on data availability – with only 60 countries tracked in the latest iteration of the CCPI.

## International assessments of climate policy constraints

In this section we examine the different types of constraints to climate policy that have been identified in the literature to date. We structure these into three broad areas already discussed: the role of interests, institutions and ideas. Our primary source is a series of comparative international studies, which we derive from a search in the Web of Science and Scopus [search – I lost it somehow!!], followed by manually searching and snowballing references in Google Scholar. Studies examining only emissions outcomes are rejected. Our focus is instead on the adoption of legislation, climate policies, policy stringency and policy outcomes (defined in Table 2). We complement the discussion of these with relevant case study, surveys and qualitative research, particularly from literatures on public policy making and climate change perceptions.

### Interests

A diverse set of interests are at risk from strong climate policy. Most prominently, electricity utilities with large portfolios of fossil fuel generation (coal, oil and gas) will face increased compliance costs in the short term, along with the upstream suppliers of these fuels (fossil extraction, refining and transportation industries). In the long term, effective and global reforms ought to phase out freely carbon-emitting activities entirely, threatening the standard operating practices of some of the largest international companies in existence (e.g. Shell, BP, Sinopec, Saudi Aramco and others). Other energy-intensive industries are also materially exposed to climate policy, such as mining and smelting firms, and chemical and heavy manufacturing industries. These various interest groups are likely to strongly oppose climate policy.

There is mixed evidence that fossil interests influence the adoption of climate legislation, but stronger support for the claim that they oppose climate policy adoption and stringency. An early study on the CLIMI legislation index indicated that high shares of industry in GDP reduced adoption rates (Steves & Teytelboym, 2013), while Lachapelle & Paterson (2013) and Fankhauser et al. (2015) find a negative correlation between high shares of fossil fuel exports in GDP and climate legislation adoption, but not a significant relationship. In terms of climate policies, Dolphin et al. (2016) show that carbon tax adoption is strongly limited by high industry shares of GDP, as well as fossil fuel shares of electricity generation (coal and oil, but not gas). Carbon tax stringency, in turn, is affected by high shares of coal in the energy generation mix in particular (Dolphin et al., 2016; Levi, Flachsland, & Jakob, 2019).

Fossil interests may take different approaches in minimising their exposure to regulation. Direct opposition to climate policy adoption (or the roll-back of existing policies) has been well documented in case studies, such as the carbon tax repeal in Australia (Crowley, 2017), heavy lobbying against coal regulation in South Africa (Baker, Newell, & Phillips, 2014), and the more recent and widely commented-on failure of a carbon price ballot in Washington State, US. Yet, when high political demand for climate policy is perceived, affected interests may also take a hedging strategy: supporting the adoption of policy, but pushing for exemptions or a particular instrument in order to minimise compliance costs (Meckling, 2015). This occurred in the case of the EU Emissions Trading Scheme (ETS), where industrial associations representing oil and gas and electric utility interests took a pro-regulation stance, but favoured emissions trading over a carbon tax, due to lower predicted costs (Meckling, 2015). The influence of vested interests is therefore mediated by domestic political contexts, and may not necessarily manifest as opposition to climate legislation or policy adoption.

Besides fossil fuel interests, other groups are likely to have a stake in climate policy processes. Environmental NGOs are vocal proponents and are known to support and participate in a wide array of decision making and governance activities (Kuyper, Linnér, & Schroeder, 2018). Indeed, there is cross-national evidence that the absence of environmental NGOs hinders the adoption of climate legislation (Böhmelt, Böker, & Ward, 2016; Fankhauser et al., 2015). Similarly, low-carbon industries (e.g. renewable energy producers) are an interest group that would materially benefit from climate policy. There is emerging evidence from the case study literature that they indeed support and can be decisive for the adoption of climate policies, but require nurturing through technology policies in order to gain an initial foothold (Meckling, Sterner, & Wagner, 2017; Pahle et al., 2018). Workers and unions are another important constituency, often vocal in opposition to reforms that result in job losses. International studies are limited, but small-n comparative research indicates heavy resistance from coal industry workers in particular, who are often well unionised and geographically concentrated (Spencer et al., 2018).

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| **Study** | **Dependent** | **Identified constraints and their reported effects on the adoption and stringency of climate legislation and policy**  **(+ higher value increases adoption/stringency | - decreases adoption/stringency |** 0 **no effect)** | | |
| **Interests** | **Institutions** | **Ideas** |
| (Levi et al., 2019) | **Climate policy stringency**  [Weighted carbon price level across 191 jurisdictions] | - Share of industry in GDP (+)  - Share of coal in ene. generation (-)  - Share of oil in ene. generation (0) | - Democracy index score (+)  - Government effectiveness (+)  - Control of corruption (+)  - Multilevel governance (e.g. EU) (+)  - Development level (GDP) (+)  - Political concentration (veto points) (0)  - Majoritarian voting system (0) | - High public belief in human-made climate change (+) |
| (Dolphin et al., 2016) | **Climate policy adoption**  [Carbon price adoption in 136 countries + 63 subnational jurisdictions] | - Share of industry in GDP (-)  - Share of coal in elec. generation (-)  - Share of oil in elec. generation (-)  - Share of gas in elec. generation (0)  - Share of trade in GDP (+) | - Development level (GDP) (+)  - EU membership (+)  - Democracy index score (+)  - Institutional capacity (Government effectiveness, Regulatory Quality) (0) | - Left/right political ideology (0) |
| **Climate policy stringency**  [Carbon price level across 37 countries + 24 subnational jurisdictions] | - Share of industry in GDP (-)  - Share of coal in elec. generation (-)  - Share of oil in elec. generation (0)  - Share of gas in elec. generation (0)  - Share of trade in GDP (0) | - Development level (GDP) (+)  - EU membership (+)  - Institutional capacity (Government effectiveness, Regulatory Quality) (0) | - Left/right political ideology (0) |
| (Fankhauser et al., 2015) | **Climate legislation adoption**  [Targets and policies within a given year across 63 national jurisdictions] | - Pro-green lobby (IUCN members) (+)  - Share of fossil/mining exports in GDP (0) | - Existing legislation and path dependency (e.g. presence of flagship laws) (+)  - Electoral cycles (strong democracies) (-)  - Electoral cycles (weak democracies) (0)  - Concentration of political power (seat shares of ruling party in all legislatures) (+) | - Right-political ideology (Anglo-Saxon countries (-)  - Left/right political ideology (all countries) (0) |
| (Böhmelt et al., 2016) | **Climate legislation adoption**  [UNFCCC protocols + emissions across 149 national jurisdictions] | - Pro-green lobby (IUCN members) (+) | - Political participation (freedom of speech, assembly, association) (+)  - Political freedoms (suffrage, elections, women’s political rights) (+) |  |
| (Lachapelle & Paterson, 2013) | **Climate policy adoption**  [Adoption of regulations, incentives, carbon price, voluntary agreements, R&D across 19 countries] | - Fossil fuel exports (-) | - Democratic Polity score (+)  - Parliamentary system (+)  - Variety of capitalism affects instrument choice (0)  - Proportional representation (0) |  |
| (Fredriksson & Neumayer, 2013) | **Climate legislation adoption**  [CLIMI Index for 87 countries] |  | - Years of democracy, with depreciation during autocracy (+)  - Constraints on the executive (e.g. independent judiciary) (+)  - Political competition (free and fair elections) (0) |  |
| (Obydenkova & Salahodjaev, 2017) | **Climate legislation adoption**  [CLIMI Index for 94 countries] | - CO2 per capita (-) | - Democracy index score (+) | - Social cognitive capital (IQ) (+) |
| (Steves & Teytelboym, 2013) | **Climate legislation adoption**  [CLIMI Index for 73 countries) | - CO2 per GDP (-)  - CO2 per capita (-)  - Share of industry, mining, utilities in GDP (-) | - Democracy Polity score ( 0 controlling for public knowledge, CO2 per capita and Kyoto commitments)  - Government effectiveness & regulatory quality ( 0 controlling for public knowledge, CO2 per capita and Kyoto commitments)  - EU membership (+)  - Post communist (0) | - Public knowledge of climate change (+) |
| (van Beers & Strand, 2013) | **Climate policy adoption (fossil fuel subsidy reform)**  [Petrol and diesel prices for 201 countries] | - Oil export surplus (-) | - Development level (GDP) (+)  - Control of corruption (+)  - Years of democracy (+)  - Shift to democracy (- then +)  - Presidential system (-)  - Proportional representation (+)  - Concentration of political power (seat shares of ruling party) (-) |  |

**Table 3: Cross-national studies of political economic constraints to climate policy**. Note: in some cases we do not report variables outside the interest/institution/ideas typology. Often these are control variables such as the share of trade in GDP (Böhmelt et al., 2016), or effect of economic cycles (Fankhauser et al., 2015).

Fossil fuel consumers have been extensively discussed in the context of efforts to reform fossil subsidies in the global South. Fossil fuel subsidy reform renders certain consumption behaviours more expensive (e.g. household energy and vehicle use) and can have varying distributional consequences (Sovacool, 2017). In some countries, fossil fuel subsidies primarily benefit middle and upper classes (i.e. the few households that have electricity and cars) (Dorband, Jakob, Kalkuhl, & Steckel, 2019; Ohlendorf, Jakob, Minx, Schröder, & Steckel, 2018). Hence they may be an intentional distribution of rents designed to ‘buy’ the support of politically influential constituencies (Lockwood, 2015; van Beers & Strand, 2013). In other contexts, fuel subsidies also benefit poorer households (e.g. kerosene for cooking and lighting), but are often ineffective mechanisms for poverty reduction (Rao, 2012; Sovacool, 2017). Van Beers and Strand (2013) show that oil exporting countries in particular fail to limit fuel subsidies, perhaps due to widespread perceptions that domestic oil resources “belong to the people”. These complexities and the direct and visible nature of subsidy benefits to consumers have rendered reform very difficult, particularly in countries with weak institutions (which limits the delivery of more targeted welfare policies) and autocratic forms of governance (which often rests on visible payments to powerful constituencies) (Lockwood, 2015; van Beers & Strand, 2013; Victor, 2009).

### Institutions

Institutions and governance arrangements have important procedural roles in the adoption and implementation of climate policies. Institutions include formal democratic systems such as elected parliaments and the distribution of powers between different state ministries, as well as less formal methods of exchange and governance between public and private actors through consultations, lobbying and so forth. Public institutions are also the primary vehicles for monitoring private sector activities and enforcing regulations, and hence have a central role in public policy implementation. Institutional analysis recognises that political struggles are mediated by these diverse arrangements, with significant consequences for the political economy of climate policy (Lockwood et al., 2016).

To date there has been much attention on the role of democracy, which (contra autocracy) is argued to have particular features that favour the adoption of climate policy. Notably, democracies are inclusive, enabling citizens to formulate environmental preferences and manifest these in policies and governance (Böhmelt et al., 2016). Such entitlements are reflected in the greater number of NGOs dedicated to environmental causes in democratic countries (and the absence of these in autocratic states), as well as their tolerance for a diverse and free press, which has an instrumental role in articulating policy demands and providing oversight of political activities. Moreover, democratic governments have stronger built-in incentives to provision public goods such as climate protection and basic infrastructures – e.g. health, water and sanitation – since these provide social benefits to a wide electorate on which they depend for legitimacy and support. In regimes with restricted electoral competition, political power tends to be arbitrated by a small elite (e.g. capitalists, the military, or religious institutions). Incumbents know that political survival depends on government expenditures favouring this elite, and not on the broad provisioning of public goods that benefit many (Böhmelt et al., 2016; Deacon, 2009). In this manner, discussions of institutions and environmental policy often draw from an extensive literature tradition on the role of democracy in facilitating (and being mutually strengthened by) the provision of public goods (Bardhan, 2016; Deacon, 2009; Tjernström & Tietenberg, 2008).

These hypotheses are supported by cross-national evidence. Higher indexes of democracy and democratic inclusiveness (e.g. strength of civil society, participation and political freedom) correlate with the adoption of climate legislation (Böhmelt et al., 2016; Lachapelle & Paterson, 2013; Obydenkova & Salahodjaev, 2017), the adoption of carbon prices (Dolphin et al., 2016; Levi et al., 2019), and the absence of fossil fuel subsidies (van Beers & Strand, 2013). Time-averaged analysis also confirms that the long-term accumulation of democratic norms and institutional apparatus is needed to support climate legislation adoption (Fredriksson & Neumayer, 2013; van Beers & Strand, 2013). Periods of autocratic rule leave a social and political legacy that is difficult to shake: newly democratising countries are often more focused on consolidating institutions and trust, building competencies and addressing ‘urgent’ issues, rather than climate policy adoption.

Of course there are large differences between democracies and their institutions. A prominent claim is that the concentration of political power in centralised and parliamentary systems offers fewer frictions to climate policy adoption relative to federalist and presidential systems, which diffuse power among a wide range of actors (Lockwood et al., 2016). In the latter case, a resulting profusion of ‘veto-points’ could limit the passage of strong climate policy – for instance when low-level states dependent on coal mining unilaterally block national measures (REF?). There is cross-national evidence that parliamentary systems are more likely to adopt climate policies (Lachapelle & Paterson, 2013), but they do not reduce emissions faster (Lachapelle & Paterson, 2013). Nor do more concentrated political systems with parliamentary majorities implement more stringent carbon prices (Levi et al., 2019). Hence there is no clear perspective on which types of democratic system are more promising.

State institutions also vary in terms of quality and exposure to corruption. In wealthier countries, bureaucracies can mobilise greater financial and human resources to formulate and implement policies. In poorer countries, states can often fail to carry out even basic functions, such as effective taxation. These conditions are often referred to as ‘state capacities’ in the institutional literature, a broad definition that encapsulates issues and indicators of “government effectiveness”, “rule of law”, and “control of corruption” (Holmberg, Rothstein, & Nasiritousi, 2009; Kaufmann & Kraay, 2015). In this context, it has been suggested that the implementation of more sophisticated climate policies (such as feed-in-tariffs) are a foregone conclusion where poor state capacities are prevalent (Jakob et al., 2014). Indeed, there are strong positive correlations between weighted carbon prices levels and subjective scores of “government effectiveness” and “regulatory quality” (see Kaufmann & Kraay, 2015), even after controlling for GDP (Levi et al., 2019)[[3]](#footnote-3). Poor control of corruption is also associated with a failure to reform fossil subsidies (van Beers & Strand, 2013) and carbon tax stringency (Levi et al., 2019). In the extensive development literature, poor state capacity is associated with a wide range of failures, such as underinvestment in public health, poor economic performance (e.g. GDP), low environmental quality (e.g. air pollution, carbon emissions), and poor human well-being outcomes (Holmberg et al., 2009; Savoia & Sen, 2015).

### Ideas

Climate policy has long been a battle of ideas, with much contestation centred on the perceived existence, severity and human-driven nature of climate change. Many have reasoned that if the public remains in doubt regarding the causes and impacts of climate change, then legislators will be unwilling to push for climate policy adoption (Drews & van den Bergh, 2016; Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015). Indeed, public belief in climate change to a large extent explains willingness-to-pay for climate policies in a US survey (Kotchen, Boyle, & Leiserowitz, 2013). Public opinion matters for public policy making.

There is an extensive literature examining the underlying drivers of climate change perceptions. Much attention is paid to left- versus right-leaning political orientations, which appear to correlate with positive and negative attitudes, respectively, on climate change belief, concern and preference for policies (Drews & van den Bergh, 2016; Ziegler, 2017). The negative impact of right-leaning political orientations can be weakened if individuals endorse a deeper set of values with respect to nature (Drews & van den Bergh, 2016; Ziegler, 2017) and may in fact be relatively unique to Anglo-Saxon countries where the phenomenon has been most intensively studied (US, UK, Canada and Australia). These countries are most exposed to well organised networks of climate scepticism and misinformation (Farrell, 2016; Farrell, McConnell, & Brulle, 2019; Lewis, Palm, & Feng, 2018; Painter, 2011), again underlining the manifold channels by which interests can intentionally hinder climate policy (Oreskes & Conway, 2010).

In cross-national studies, education emerges as the most significant predictor of climate change awareness and risk perception (rather than belief) (Lee et al., 2015; Lewis et al., 2018), followed by media freedom (Steves & Teytelboym, 2013). Accordingly, countries with low educational achievements and media landscapes that fail to prioritise climate reporting can have majority populations that are simply unaware of climate change, as is the case in India, Bangladesh, Egypt and Nigeria (Lee et al., 2015). Climate change awareness is in turn a significant determinant in cross-national regressions of weighted carbon prices (Levi et al., 2019) and climate legislation adoption (Steves & Teytelboym, 2013). Of course, here there is a particularly strong case for reverse causality, insofar as climate policy formulation is likely to increase public awareness of the problem.

Trust is another key element of national ideational context that shapes climate policy support. It is the notion that other individuals, institutions, scientists, or politicians share common social norms and act in a mutually beneficial way (Drews & van den Bergh, 2016; Smith & Mayer, 2018). A lack of trust in institutions implies limited confidence that environmental policies will be effective (Harring, 2014); while low social trust (e.g. in others generally) undermines collective action, since few will have the confidence that others are ‘doing their part’. In a small-n comparative study, Smith and Mayer (2018) find that individuals with high levels of social and institutional trust far more willing to support costly climate policies. Hammar and Jagers (2006) find a similar result for trust in politicians in Norway, while Fairbrother (2016) extends the analysis to an international survey, showing a consistent and positive pattern of trust in explaining environmental policy support. Against a backdrop of progressively eroding trust in social and political institutions, this is a problem that has likely not received the attention it deserves (Fairbrother, 2017).

### Lessons, problems and next steps

* More on legislation adoption than policy adoption. Very little on policy stringency and outcomes (Note: also because we are in the ‘early days’), nor on comparing different dependents.
* Potentially missing variables: resource rents, fractionalisation. Many studies test climate policy adoption against per capita emissions (Obydenkova & Salahodjaev, 2017; Steves & Teytelboym, 2013), or shares of industry in general . Tautological thinking… it is hard to regulate fossil fuels, when there are lots of fossil fuels
* Above all, focus is more on identifying individual constraints, and not focusing on their trends and global distribution.
* We can speculate that countries are not likely to suffer from individual constraints, but multiple overlapping issues that are strongly interrelated.
* Useful to think about political economy regimes. Institutions, social cohesion and social provisioning have interlocking roles.

<https://www.v-dem.net/en/news-publications/democracy-reports/>

closed autocracy, electoral autocracy, electoral democracy, liberal democracy.

- rentier states

Chayes, S., 2017. When corruption is the operating system: the case of Honduras. Washington, DC.

van der Ploeg, F., 2011. Natural Resources: Curse or Blessing? J. Econ. Lit. 49, 366–420. doi:10.1257/jel.49.2.366

- danger of thinking that ‘all good things go together’ (Bardhan, 2016)

## Stylized facts

See Rao & Pachauri 2017 for stylized facts.

### Data

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Unit | Date range | Source |
|  |  |  |  |

### Correlations and overlapping constraints

### Trends and improvements in constraints

- trend in climate concern, see Capstick et al. 2015

“It appears that we cannot expect climate change policies (and perhaps international environmental policies more generally) to improve rapidly in countries that recently experienced democratization. Only over time do democratic principles penetrate a society and its policymaking apparatus sufficiently to have a positive effect.” (Fredriksson & Neumayer, 2013)

See also, corruption in post-communist states: <https://www.tandfonline.com/doi/full/10.1080/1060586X.2014.931683>

* Shouldn’t misunderstand the development process … democratic bias… no slow progress towards democracy, capable institutions and climate-aware citizens … but a landscape of distinct regime types (Levitsky and Way 2002)… punctuated by periodic upheavals, but otherwise quite stable.
* “The assumption that hybrid regimes [partial democracies] are (or should be) moving in a democratic direction lacks empirical foundation… these cases should be conceptualized for what they are: a distinct, nondemocratic regime type.” (Levitsky and Way 2002)

### Cluster analysis

Correspondence analysis (Koch & Fritz, 2014)

DFMA?? (Fritz & Koch, 2016)

## Discussion

## Conclusion

In the face of these political economic challenges, authors have naturally called for packages of climate reform that address multiple underlying issues. For instance, earmarking carbon tax revenues for public goods and infrastructures could enhance the public acceptability of policies (Jakob et al., 2016), while pragmatic compensation mechanisms may be needed to buy the support of affected interest groups (Vogt-Schilb & Hallegatte, 2017). There is also wide agreement that establishing “enabling environments” and “institutional capacities” are basic pre-conditions for effective climate policy that are currently lacking (Carbon Pricing Leadership Coalition, 2017).

These are sensible and needed prescriptions, but they risk overlooking a larger architecture of constraints. Fossil fuelled economies are naturally resistant to change: they comprise not just the fixed infrastructures that need to be adapted or retired, but also the social and political systems that have co-evolved with them (Geels et al., 2017). These regimes have design features that either preclude the possibilities for reform, or hamstring those agencies that are responsible for implementation. Thus the terminology of ‘weak institutions’ and ‘lacking political will’ masks the *deliberate* nature of such deficiencies (Chayes, 2017). (… research on regimes?)

* Carbon lock-in literature?? Tends to focus more on individual actions than policies?
* Theoretical perspectives in Lachapelle & Paterson 2013

S. J. Davis and R. H. Socolow, “Commitment accounting of CO2 emissions,” *Environ. Res. Lett.*, vol. 9, no. 8, p. 84018, Aug. 2014.

C. McGlade and P. Ekins, “The geographical distribution of fossil fuels unused when limiting global warming to 2 °C,” *Nature*, vol. 517, no. 7533, pp. 187–190, Jan. 2015.

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1. It may be useful for climate scientists to frame these contexts as mechanisms that actively prevent mitigation – hence ‘constraints’ – rather than continue to adopt the inverse and more neutral language of ‘determinants’ and ‘enabling conditions’. [↑](#footnote-ref-1)
2. Thanks to Giulio Mattioli for this insight [↑](#footnote-ref-2)
3. Dophin et al. (2016) do not find a significant effect of these indicators on carbon price adoption or stringency. However, their study is based on a smaller sample of mostly wealthier states with strong institutions. [↑](#footnote-ref-3)