

Five Worlds of Political Strategy in the Climate Movement[†]

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ABSTRACT

The chasm between required and actual emissions abatement continues to grow in part because stringent climate laws and policies have repeatedly been blocked, repealed or weakened by obstructionist lobbies. Lobbying by the corporate climate change countermovement dwarfs that by the climate movement. To make meaningful progress towards global emissions abatement, smart political strategies are needed. Drawing on evidence from sociotechnical transitions and emancipatory social movements across history, we propose a taxonomy of five strategic paradigms for overcoming obstructionism: **antagonism** (“name, shame, boycott and sue”), **appeasement** (“compensate the losers”), **co-optation** (“change from within”), **institutionalism** (“change the rules of the game”) and **countervailance** (“bolster the alternative”). Each “world” of strategy addresses the problem of obstructionism through a different lens, reflecting a diversity of actors, tactics, and theories of change. We develop a simple heuristic framework to explore how these strategies change a politician’s incentives across different socioeconomic, political, and institutional contexts. Although some strategies hold sway over others in certain contexts, we find that due to mutually-reinforcing feedback dynamics, all will have a role to play in expediting the post-carbon transition.

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1 Introduction

Great socioeconomic transitions involve significant shifts in power. The transition to a post-carbon economy will not be different. The exigencies of climate policy, enshrined in the 2015 Paris Agreement, require economic and energy systems built around hydrocarbons to transition swiftly to a net-zero emissions paradigm by 2050. Some firms will die, others will successfully diversify, and those specialising in low-carbon technologies will likely gain market share. The “existential politics” of the post-carbon transition (Colgan, Green, and Hale 2020), notably the \$10-22 trillion worth of assets at risk of stranding (Mercure *et al.* 2018; Tong *et al.* 2019), makes it particularly prone to obstructionism by entrenched vested interests.

The climate change countermovement (CCCM) has received growing scholarly attention in recent years (e.g. Brulle 2014; Farrell 2016). The CCCM lobby is a “*group agent*” consisting of members who engage in tactics to **prevent, repeal, weaken or delay** existing and proposed climate policies and legislation. Members of the CCCM lobby may include industry associations, carbon-exposed firms, utilities, workers, unions, and corporate-funded public relations think tanks who endeavour to obstruct climate policy rather than adapt to it. CCCM members may also include state-owned enterprises and government ministries with strong institutional incentives to protect fossil fuel interests.

The corollary to an active CCCM lobby is the “climate movement”. The strategic operations of the climate movement have received relatively scant attention in lobbying literature. Studies of interest group competition tend to mainly focus on the political organisation of renewable energy companies and environmental NGOs (e.g. Brulle 2018). Our consideration of a broader climate movement, consisting of a wide range of actors including students, lawyers and elite high net worth individuals sheds more light on the available strategies in the post-carbon transition. This is important since the CCCM lobby tends to have more relational and financial capital at its disposal than the climate movement due to its higher level of entrenchment within the system.

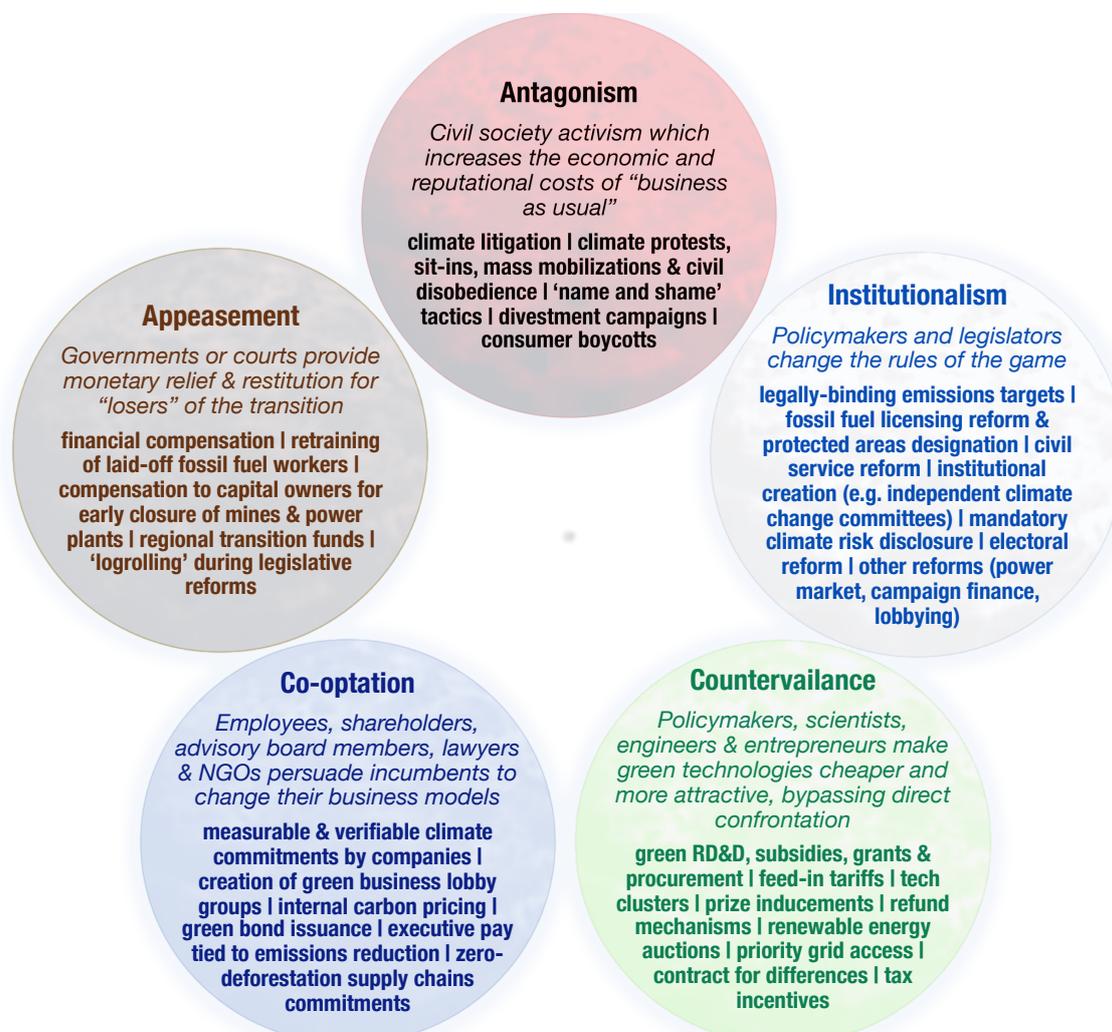
We document tactics deployed by members of the climate movement and classify them into a typology of political strategies to overcome obstructionism by the CCCM lobby. The typology we develop identifies five key political strategies (Figure 1):

- *Antagonism* which increases the reputational and economic costs of participating in obstructionism and “business as usual” activities;
- *Appeasement* which offers monetary relief, re-training and restitution to the “losers” of the transition;
- *Co-optation* which seeks “change from within” by persuading the obstructionists to reform and/or diversify their business model;
- *Institutionalism* which involves regulatory and structural changes at the level of public institutions to make obstructionism harder; and
- *Countervailance* which bypasses direct confrontation with political opponents by supporting alternative technologies and strengthening their disruptive market potential.

We highlight how each “world” of strategy advances a rival theory of change, contains distinct tactics and is best suited to different actors (Figure 1). The aim of the framework is to illustrate the different ontologies and epistemologies that underpin efforts to overcome climate policy obstructionism. Although we present

the “five worlds of strategy” in the context of climate change, we believe the typology is broadly applicable to any context in which there is organised resistance.

Figure 1. Five Worlds of Political Strategy



We also develop a heuristic framework to assess how politicians’ incentives to enact stronger climate policy may change in response to these strategies under varying institutional conditions. Based on several stylized scenarios, we show that the choice of strategy is sensitive to a small set of macrostructural parameters that include:

- (i) *democratisation*: the bargaining power citizens relative to business interest groups;
- (ii) *climate-consciousness*: the salience and power of citizens who support climate policy relative to citizens who oppose it; and
- (iii) *green industrial incentives*: the power of business interests group who support climate policy to those who oppose it.

Our heuristic framework is flexible and can be calibrated to gauge the potential impact of interest group strategies across diverse political economy regimes, from the many varieties of democracy and interest group pluralism to distinct forms of oligarchy. Our analysis demonstrates that due to positive feedback loops and mutual reinforcement, each strategy has a role to play. Some may initially outperform others

due to the institutional context, while others may set the stage for more ambitious action later. Tactics that garner the most success are: (i) appropriate to the actors who carry them out; (ii) appropriate to the institutional setting in which they are applied; and (iii) timely.

Few studies in the literature have situated both the CCCM lobby and the climate movement within a single political economy framework describing the dynamics of political competition. This is a gap our paper aims to address. Closely related studies are those of Aklin and Urpelainen (2013) and Meckling (2019) which look at ‘green’ versus ‘brown’ governments, focusing on how politicians attempt to exploit path dependence and policy lock-in while their coalition is in power. Our framework builds on this by featuring multiple strategic actors: the CCCM lobby, the climate movement, the citizenry, and politicians. We believe this is an important addition which allows us to explore rich, interactive dynamics.

Furthermore, we focus on “perceived welfare” rather than real welfare to capture issues around misinformation and biases, which would otherwise be excluded if agents are assumed to be perfectly rational and well-informed. In the climate sphere, this is especially important since misinformation and climate denialism have been used as strategic tools. The mechanisms by which interest groups have unequal influence over climate policy-making operate not only through the *actual* distribution of constituents’ preferences but also through politicians’, firms’ and citizens’ (imperfect) *perceptions* of these preferences (Stokes 2020; Rafaty 2018). Although studies acknowledge such biases exist and have tested them empirically (e.g. Gilens 2012; Gilens and Page 2014), incorporating them into a heuristic models on decision-making and inter-group conflict is limited.

The relevance of our work stems from a growing understanding that climate policy is rarely the outcome of ‘optimal’ decision-making (Stokes 2020). Purely technocratic proposals to enhance policy are of little practical value if they fail to survive the political process (Cullenward and Victor 2020). It is in this second, third, or fourth best world that political strategy to advance the climate movement’s agenda becomes of paramount importance, especially as the timeframe to limit warming to 2 degrees Celsius is narrowing. We combine our typology of five strategies with the heuristic framework to identify plausible “sensitive intervention points” (Farmer et al 2019) which can lead to system-level change towards a post-carbon future.

The rest of the paper is organized as follows: section 2 provides a brief overview of climate obstructionism and explains how it is a global phenomenon, section 3 describes the five strategies in detail, section 4 presents the heuristic framework, and section 5 discusses the possibility of system-level change.

2 Brief Overview of Obstructionism

Whether it is the diversity of tactics, the cultivation of deep political networks (Farrell 2016), or the extent of expenditure (Brulle 2018; Ard, Garcia, and Kelly 2017), CCCM lobbying dwarfs climate movement lobbying on all dimensions. Tactics used to incentivize and extract favours from politicians include offering lucrative private sector roles after serving in office (Blanes i Vidal, Draca, and Fons-Rosen 2012), strategically leveraging tax-free corporate philanthropy for political purposes (Bertrand *et al.* 2020), threatening politicians with competition if they do not acquiesce to a particular demand (Stokes 2020; Dal Bó and Di Tella 2003; Chamon and Kaplan 2013), inserting representatives into political and regulatory institutions to directly impact policy formation (Leonard 2019), and swaying voters and politicians by

sponsoring advocacy institutions, agenda-driven think tanks and media outlets (DellaVigna, Durante, and La Ferrara 2016). All of these tactics have been leveraged by the CCCM lobby.

Obstructionism in the US has been especially well-documented (Stokes 2020). The domestic CCCM lobby obstructed efforts to establish a national cap-and-trade scheme in 2010, an endeavour which came at a substantial cost to society (Meng and Rode 2019). The lobby also captured the Environmental Protection Agency and generously funded climate denialism (Farrell 2016). Koch Industries, ExxonMobil, and the American Legislative Exchange Council have been central nodal points in the spread of misinformation about climate change and the funding of think tanks and pseudo-grassroots organisations to discredit climate action (Leonard 2019; Stokes 2020). The tactics of ExxonMobil have extended beyond the domestic sphere to the international arena where the company founded the Global Climate Coalition, a powerful erstwhile multinational lobbying consortium that staunchly opposed the Kyoto Protocol. Polarization of climate change issues along partisan lines has been a concerted strategy which has led to repeated U-turns in US climate policy (Kim and Urpelainen 2017), including the Trump Administration's withdrawal from the Paris Agreement and Biden's subsequent re-instatement.

However, climate policy obstructionism is not unique to the paradigmatic US case. Many other nations with indigenous fossil fuel resources have their own forms of obstructionism. In several instances, the obstructionists are state-owned enterprises who exert disproportionate influence within elite governmental structures.

In India, the resistance to the post-carbon transition primarily originates within governmental structures. The central government's majority stake in Coal India Limited, the world's largest coal company by production, creates perverse regulatory incentives and misalignments in policy objectives across ministries. Overt instances of obstructionism include the government's periodic censorship of grassroots civil society groups advocating for stronger environmental regulations (Nandi 2020), and the freezing of the bank accounts of NGOs such as Greenpeace and Amnesty, in retaliation for their role in publicly exposing the human and environmental costs of open-pit coal mining (Burke 2015; Kumar 2020).

In China, provincial politics is tilted in favour of high-carbon "prestige projects". Chinese provinces operate in silos, eager to secure their own energy needs and pursue large-scale investments to boost reported GDP growth rates. This results in incentives to build capital-intensive, carbon-intensive assets, such as coal-fired power plants, even if they will be under-utilised and economically inefficient. For example, when licensing authority was devolved to provincial authorities in 2014-16, an extra 169 GW of coal-fired capacity was added to the project pipeline (for context, Europe's total installed electricity capacity is <150 GW). China's nationwide plans for "carbon neutrality" by 2060 must confront the reality of provincial politics and the influence of carbon-intensive state-owned enterprises.

In Russia, a staunch CCCM lobby has blocked and diluted climate policy ambition. In 2019, The Economic Development Ministry drafted a bill which proposed quotas on CO₂ emissions, a national emissions trading system, and penalties for polluters. However, Russia's most powerful business lobby, the Russian Union of Industrialists and Entrepreneurs (RSPP), intervened to obstruct these proposals, which were subsequently scrapped and replaced with a lax "climate audit" provision. The Chairman of Corporate Social Responsibility at RSPP stated, "we have to maximize our sales of gas, oil, and coal as much as we can without stopping while there is still a buyer for it..." (Gershkovich 2019).

In Germany, a large domestic carbon-intensive industrial lobby has pressured politicians to obtain subsidies, tax exemptions, and protections against an “overly speedy” energy transition. Green-left party strength in the late 1990s and early 2000s led to the passage of feed-in tariff legislation that caused solar PV and wind energy installations to surge. But as soon as this began to pose a commercial threat to energy-intensive, trade-exposed industries parliament stepped in to amend the feed-in tariff four times until it was replaced with a lax market mechanism (Leiren and Reimer 2018). Under successive coalition governments, parliament and ministerial departments have curtailed regulatory support for renewable energy, exempted heavy industry from paying various energy taxes, abandoned a proposal for a carbon tax, and subsidized coal production in the name of economic competitiveness and energy security (Leipprand and Flachsland 2018). The domestic lignite lobby in early 2020, under mounting pressure, settled for hefty financial compensation in return for a protracted phase-out involving early plant closures up to 2038.¹

In Australia, the Abbott government (2013-2015) repealed a national carbon pricing scheme only two years after it was enacted due to organized industry resistance. At the time, an estimated one-third of media coverage of climate change in Australia was biased in favour of climate scepticism, with disinformation campaigns openly sponsored by media mogul Rupert Murdoch (Bacon 2013).

In Brazil, the Bolsonaro government has secured powerful support and avoided criticism from his party’s rural agribusiness and mining base by dismantling environmental regulations, disenfranchising indigenous forest dwellers, and facilitating land-grabbing across the Amazon and Cerrado biomes, leading to a rise in deforestation rates after years of effective reduction (Rochedo *et al.* 2018).

Even in the European Union, which is considered an innovator in climate policy, obstructionism is present. Studies of lobbying activity show that carbon-intensive industry associations have actively endorsed the emissions trading system (ETS) during periods of reform but have used it as a Trojan Horse to pre-empt stricter regulations. The CCCM lobby has also successfully lobbied for corporate welfare provisions, such as free allowances to dilute the impact of the ETS and in some instances, generate windfall profits (Markard and Rosenbloom 2020).

Therefore, the world over, climate politics abounds with high-profile episodes of the prevention, dilution, or reversal of climate change mitigation laws and policies. The persistent difficulty in phasing out implicit and explicit fossil fuel subsidies is a testament to the degree of hysteresis within the system (Skovgaard and van Asselt 2018). A broad historical sweep of the comparative politics of climate policy reveals how it has been a “tug-of-war” between contending interest groups (Jahn 2016; Mildemberger 2020; Stokes 2020) rather than any form of technocratic or “optimal” policy setting.

¹ Resistance to energy transition policies in Germany is not limited to conventional energy system incumbents. Replacing existing power capacity requires extensive electricity grid expansion in order to distribute surplus wind energy generated in the northern states to the rest of the country, but many southern state officials and citizens groups have resisted construction of high voltage lines in their area, causing crippling delays for new grid expansion projects. This is a relatively new source of obstructionism and highlights the kinds of resistance which other countries may encounter as renewables transition from a marginal to a central power source.

3 Five Strategies to Change a Politician's Incentives

We now review the five strategies, and the ontologies and epistemologies that underpin them. How do different strategists in the climate movement see themselves and relate to each other? What is their theory of change? Which actors are best suited to carry out each strategy? We will consider these questions for each strategy in turn.

Antagonism

Antagonism springs from grassroots movements by activists, indigenous groups, lawyers, academics, social enterprises, NGOs, and civil society at large. Antagonistic action seeks to awaken public consciousness about the urgency of climate change. Antagonists aim to (i) challenge the social “license to operate” for businesses engaged in carbon-intensive production that are resisting or stalling reform, and (ii) pressure governments to act with greater urgency to reduce emissions. The antagonist mantra can be summarised by: “name, shame, sue, boycott, and blockade”.

Antagonism places great emphasis on the egalitarian, participatory, deliberative, and emancipatory ideals of democracy. Antagonists seek to elevate the voices, environmental concerns and grievances of citizens. Many antagonists see themselves on the frontlines of a struggle against the undue political influence of wealthy corporate polluters or biased governmental institutions.

Antagonists reject the depoliticization of the public sphere and challenge those who have a preference for stolid, amiable, elite and technocratic approaches. Antagonists see the latter as too quick to dismiss the necessary aspects of socio-political conflict, and too “out of touch” with the struggles of ordinary citizens. Climate activist, Greta Thunberg, is an archetype of a climate strategist that espouses the theory of change embedded within antagonism, which is best captured by Frederick Douglass’ 1857 speech:

“If there is no struggle there is no progress. Those who profess to favour freedom and yet deprecate agitation are men who want crops without ploughing up the ground; they want rain without thunder and lightning. They want the ocean without the awful roar of its many waters...Power concedes nothing without a demand. It never did and it never will” (Douglass 1979, 204).

Protest movements, which are core part of the antagonistic toolkit, can raise the salience of climate change issues. The protest movement against the Vietnam War provides an instructive historical example. What began as a small and inauspicious movement on several university campuses eventually turned into a mass movement. It successfully raised public consciousness and aroused moral indignation at the atrocities that were being inflicted on the South Vietnamese population: by 1969, 58% of the public had come to regard the war as not merely “a mistake” but also “fundamentally wrong and immoral”, a view which reached 70% support by the 1980s (Kiernan 1992). Around this period, mass movements for women’s liberation and ecological awareness also scored important cultural and legislative victories through similar methods.

The 2020s may see a similar groundswell of consciousness, but this time for climate change. Activists are framing climate change along deeply moral lines, emphasising issues of intergenerational justice. For antagonists, the possibility of a social zeitgeist is not remote but rather just below the surface: they believe that democratic support for stronger climate policy will grow louder as the climate crisis is brought to the forefront of media. Where citizens have a large pull on politicians, mass mobilizations, such as those

galvanised by Fridays for Future, Extinction Rebellion, and the Sunrise Movement have a chance of altering politicians' incentives. However, in contexts where citizens' have relatively less influence compared to corporate interests, politicians may play lip-service to the demands of citizens while delaying meaningful policy reforms.

Another tactic of antagonism involves climate-conscious citizens exercising their rights as consumers to boycott products from companies that fail to act ambitiously enough on climate change. The parallel in the financial sector is shareholder activism, whereby shareholders use their influence to demand firms to invest in clean technologies and decarbonise scope 1, 2 and/or 3 emissions (Clark and Crawford 2012). If such boycotting occurs on a scale that impacts corporations' bottom line, it can create a strong incentive for behaviour change. Consumer boycotts are likely succeed in contexts where there is consumer choice and low barriers to switching. For example, competition in the retail market for electricity in the UK allows citizens to opt for suppliers that source from, and invest in, renewable energy. In the US, by contrast, switching between suppliers is exceedingly cumbersome, thus limiting the scope for this type of boycotting in the power sector.

Similarly, condemnatory exposure of alleged wrongdoing ("naming and shaming") can reduce the social license to operate in a "business as usual" manner. Historical precedent can be found with the 1904 publication, *The History of the Standard Oil Company*, written by investigative journalist Ida Tarbell. According to historian Daniel Yergin, it was "the single most influential book on business ever published in the United States", one which exposed the financial shenanigans and flagrant predations of John D. Rockefeller during his reign over the Standard Oil monopoly (Yergin 2011). The public outrage at the revelations that followed culminated in a 1911 Supreme Court ruling which dissolved the monopoly. One of the successor companies which formed in its wake was Exxon.

However, Exxon itself continued obstructionist activities. The "Exxonknew" campaign exposed how Exxon was aware of the dangers of rising CO₂ emissions as early as 1968 but publicly sowed doubt by emphasizing epistemic uncertainties and funding outlets that promulgated climate denialism (Oreskes and Conway 2011; Robinson and Robbins 1968). This provided the evidentiary basis for numerous lawsuits filed by states such as New York and California. Exxon's ignominy soon became that of the wider petroleum industry as this episode revealed that any of supermajors – Chevron, Shell, BP, Total, *et al.* – could be the next target of antagonistic litigation (Carton 2020). Such investigative reporting has converted a sizeable number of citizens who were previously ambivalent about climate policy to staunch supporters by revealing the obstructionist activities of the CCCM lobby.

Where there is a strong and independent judiciary climate litigation can also be used by citizens against the government, if government bodies are responsible for obstructionism. A high-profile case was the Urgenda Foundation v. the State of the Netherlands (2019), in which Dutch citizens sued their government over its failure to adopt ambitious climate mitigation measures. The court ruled in favour of citizens arguing that the government was in violation of citizens' constitutional right to secure adequate protection from environmental harm. Such litigation can not only result in direct changes to government policy but also increase how politicians weight the welfare climate conscious citizens.

Existing literature also shows that there may be a valid legal case to challenge the issuance of fossil fuel permits when there are low-cost energy alternatives with fewer negative externalities (Rafaty, Srivastav, and Hoops 2020). Such litigation may compel polluting corporations to overhaul their business model.

Examples of companies switching include the largest Danish power company, Orsted, which was originally invested in oil and gas but transitioned completely to wind power.

However, where the effectiveness of democracy is lower, such actions may be less effective. For example, in India, indigenous communities displaced by open-pit coal mining are often assisted by NGOs to seek legal recourse; however, the success rate of these cases is limited since local courts tend to be biased in favour of the Ministry of Coal's rhetoric.

Moreover, there is a danger of pursuing poorly crafted lawsuits that do little to reduce emissions, but which provoke companies to launch a slew of countersuits that could do greater harm. Carefully targeted legal interventions which invoke the principles and precedents of legal systems *as they are*, rather than as one *may wish them to be*, could do far more to promote legal accountability. Such interventions may even set the system on a trajectory which could ultimately help reform laws so that they better reflect the realities of climate change (Rafaty, Srivastav, and Hoops 2020).

Finally, at times there is a danger in promulgating heavy-handed tactics and rhetoric because they widen rather than narrow existing chasms. For example, when several Extinction Rebellion activists blocked commuter trains during rush hour in London in 2019, many citizens were alienated and infuriated, becoming less sympathetic to the cause. Antagonists need to convince their audiences that they are not acting out of exaggerated indignation, but rather that they are on the same side in an asymmetric tug-of-war which sometimes may require uncomfortable tactics. Nevertheless, antagonism's potential to raise the profile of the climate change agenda can play an important role in setting the stage for more ambitious action and compelling corporate and governmental leaders to take more stringent action.

Institutionalism

Institutionalism involves changing the "rules of the game" through the use of public institutional powers. It is a strategy best leveraged by those in government, the judiciary, or the technocrats who advise them. Strategists who espouse institutionalism believe that choices at the individual level are unlikely to reduce emissions, rather changes at the system level are warranted. Institutionalists are not revolutionaries who want to upend the system overnight. Instead they believe in smartly targeted gradualist interventions, which they believe will have a more enduring and long-lasting impact.

The receptivity of public institutions to changes in rules is far from guaranteed. Institutionalism often relies on "windows of opportunity" which can be generated by antagonistic tactics including mass mobilisations and legal action, illustrating the potential symbiosis between strategies. Such instances of "system criticality" (Farmer *et al.* 2019) may also arise after elections and exogenous shocks which raise the salience of the climate agenda or which force the system to do things differently (such as the COVID-19 pandemic). For example, the COVID-19 pandemic has opened an unprecedented window of opportunity to direct large amounts of fiscal stimulus towards green technologies and infrastructure (Hepburn *et al.* 2020).

Caps on corporate contributions to political campaigns are another example of changing the rules. This intervention can reduce the bargaining power of corporations relative to citizens which can incentivize politicians to pursue more stringent climate policy if: corporate lobbying disproportionately reflects CCCM interests and citizens are mostly in favour of climate policy. In several countries across the world, empowering citizens relative to corporations is likely to incentivize climate action because the above two conditions are satisfied.

Mandatory disclosure of climate risks by corporations is an institutionalist tactic that is potentially powerful (Farmer *et al.* 2019), as it can change how markets value corporations. If the assumptions that underpin corporations' market valuations are made more transparent to shareholders, and if these assumptions are increasingly viewed as implausible (e.g. robust forecasts for fossil fuel demand out to 2050), then investment is likely to move firms that do adequately consider climate change and shift the distribution of pro versus. anti-climate policy corporate interests.

This could also be complemented by measures to make it harder to access capital in the absence of legitimate climate-compatible plans. For example, one could establish negative screens on major stock exchanges to ensure that only those companies with Paris-consistent business models are allowed to raise capital on the stock market. Additionally, Central Banks could ensure that actions such as quantitative easing, that involve the large-scale purchase of corporate bonds, do not end up inadvertently supporting businesses that compromise on the stability of the system by exacerbating climate change risks. Capital is often referred to as the "Achilles heel" of the hydrocarbon sector. Institutional measures that choke the industry's access to subsidised capital are likely to have far-ranging impacts on the viability of carbon-intensive business models.

Institutionalism can also involve the establishment of independent oversight committees that shield climate policy from the vagaries of electoral cycles. For example, under the 2008 Climate Change Act, the UK established the Committee on Climate Change (CCC) which was tasked with setting science-based carbon budgets every five years, giving independent advice to the government, and reporting to the Parliament on progress. Independent commissions such as the CCC can ensure that there are checks and balances against political short-termism. In many political systems, the creation of arm's length bodies of this sort may be decisive in enhancing the credibility of long run emissions targets.

Legally binding emissions reduction targets are also impactful institutionalist measures, insofar as they provide a credible direction of travel and signal legislative intent. The EU, China, Japan, South Korea, Sweden, UK, France, Denmark and New Zealand have all passed laws or extemporary decrees establishing net-zero emissions targets. Such commitments can provide the basis upon which citizens hold governments accountable (e.g. under the strategy of antagonism). They also send strong signals to markets which can cause carbon-intensive corporations to voluntarily alter their trajectory.

Appeasement

Appeasement provides compensation to the "losers" of the transition (workers or capital-owners) as a means of quelling their resistance. Leveraging this strategy is typically the prerogative of governments, local authorities and courts. Common forms of appeasement include worker re-training programmes; pay-offs for workers and asset owners due to early closures of coal mines, steel plants, etc.; and regional transition funds to support economic diversification in localities that are dependent on climate-forcing assets.

The juridical foundations of appeasement can be found in the law of indemnities, while its moral foundations, insofar as the compensation is only directed at workers (and not capital-owners) relies on the concept of a "just transition". Appeasement for workers relies on the theory of change that successful strategy uplifts the economic hopes and developmental prospects of low-income communities. Climate activists who espouse this view include Naomi Klein and Alexandria Ocasio-Cortez who frequently bundle climate policy with measures to reduce inequality, create jobs, and uplift marginalised communities.

In regions where many were once gainfully employed at bituminous and anthracite mines, which fuelled the Industrial Revolution, there is a persistent state of economic deprivation. Many such communities retain the memory of having been left behind and harbour a deep distrust of elites. Compensation to miners and their communities was a core element of the climate proposal that US President Joe Biden advanced on the campaign trail when visiting the deindustrialized towns of the Rust Belt.

Similarly, in the coal mining belt of Eastern India, stealing from open-pit coal mines is the last recourse for indigenous communities, even though the same collieries were responsible for the deracination of forests and pastoral lands that once supported traditional livelihoods (Lahiri-Dutt 2016). A parallel exists for indigenous tribes in the Amazon and North America who have come to depend on revenues from forestry products or oil pipeline royalties. Communities in these areas have few alternatives and the irony is that they are now dependent on the same activity that marginalised them. This is not out of choice but due to desperation. Claims on preserving the coal mining or forestry to “protect the poor” overlook the real plight and nuance of these experiences.

Appeasement in these contexts will require regaining the trust of communities and, undertaking concerted efforts to re-train workers and ensure economic diversification their areas (Jakob *et al.* 2020). Transition funds can play a key role in this. Appeasement strategists believe in actuating a vision for a net-zero economic revival such that the dignity of these communities’ past is written into the energetics and architecture of their future. This way members of left behind communities are more likely to support the post-carbon transition than to resist it

However, there is another purely instrumental logic of appeasement, which does not require normative appeals about the necessity of a “just transition”. It may simply be politically expedient to pay off capital owners, in recognition of the fact that they are powerful lobbyists who may otherwise excoriate and derail important reforms.

Many groups reject this position and consider it morally dubious to give wealthy polluters “yet another bailout”. However, others point towards the discomfiting fact that such forms of appeasement have silenced powerful incumbents and paved the way for change in the past. They highlight how slave-owners were famously compensated for “lost property” during emancipatory episodes in the British Empire, Zanzibar, Haiti, and elsewhere. The logic of offering monetary compensation to slaver-owners was “to pre-empt the use of violence to end slavery”. This is analogous to the logic of compensating owners of climate-forcing assets to pre-empt further conflict and obstructionism in climate policy, notwithstanding the obvious moral differences in such a comparison.

One of the most urgent forms of appeasement in the net-zero transition concerns the early closures of coal mines. Germany is a high-profile example of a country which is navigating this challenge, and appeasement has arguably been indispensable as a means of silencing the domestic lignite lobby. Germany’s coal exit law stipulates that a total of 4.35 billion euros in compensation will be paid for planned shutdowns by 2030 (Wettengel 2020).

However, appeasement on its own, without complementary measures, could lead to inefficiently large pay-outs to the owners of climate-forcing assets. Even in the German case, challenge is imminent as the European Commission questions whether “compensating operators for foregone profits reaching very far into the future corresponds to the minimum required” (European Commission 2021). The Commission has doubts on the model used to calculate these “foregone profits”. It is likely that antagonism or institutionalism

will be needed to safeguard public interests and put a reasonable upper bound on compensation to capital-owners. We can derive lessons about the potential dangers of compensation to capital-owners from the history of compensated emancipation. The British government borrowed £20 million to compensate slaveowners, which amounted to a hefty 40 percent of the Treasury's annual income at the time. The indemnity was not fully paid off until 2015 illustrating how this measure came at a significant opportunity cost to society.

Finally, there are situations in which appeasement may have symbolic value when directed towards those who are wealthy beneficiaries of the old regime. For example, during the end of the apartheid era in South Africa, when political conflicts were especially fractious and bitter, those who confessed their crimes were pardoned, and many – not least Nelson Mandela – wholeheartedly urged others to avoid the impulse to punish the perpetrators, believing that only forgiveness could heal a bitterly torn society.

This reconciliatory view of appeasement might pertain to certain forms of climate litigation targeting multinational oil corporations. Starting in 2015, the Climate Leadership Council (CLC) in the US put forward a national “carbon dividends” proposal that included a provision to establish a “legal liability shield”, which would statutorily exempt oil and gas companies from all tort liability in court cases seeking restitution for the monetary damages attributed to their historical emissions. This provision was motivated by a theory of change which believed that no comprehensive climate legislation will ever pass through Congress without bringing the oil supermajors to the table. To bring oil supermajors to the table as allies in drafting climate legislation (co-optation), the policy must provide not only sticks but also carrots (appeasement). And the antagonistic climate lawsuits which companies would be shielded from are far less effective at reducing emissions than the carbon dividends proposal. This proposal did not prevent the outrage that many environmental groups expressed towards the audacious liability provision. However, there was another segment of environmentalists who preferred to focus on the emissions abatement that could be achieved if “carbon dividends” were adopted. Holding no particularly strong moral conviction about historical liability for emissions, they were willing to endorse the CLC's proposal as a reasonable compromise.

Countervailance

Countervailance is based on the insight that it is unlikely that the post-carbon transition will happen in the absence of cheap, clean, and dependable substitutes to the hydrocarbon assets that propelled the industrial revolution. The proponents of countervailance tend to be technology-focused and frame the climate change challenge as one around the need of a “green industrial revolution”.

Under countervailance, innovation, industrial policy, and a compelling socio-technical vision of the future are of first-order importance. On this point, individuals as ostensibly dissimilar as Karl Marx, Joseph Schumpeter, and today's Silicon Valley CEOs all agree: it is the technological conditions and possibilities available to a society which prefigure politics, culture, and institutions. They are the wellspring from which Schumpeter's “creative destruction” occurs. Technological change, before all else, determines the timing and character of great socio-economic transformations in history.

Thus, countervailance is principally concerned with creating a *countervailing force* to the CCCM lobby by supporting technological alternatives and their proponents. In the post-carbon transition, this involves “green” industrial policy to make renewable energy and other low-carbon technologies low-cost and available at scale. Governments are, in principle, best placed to leverage the countervailance toolkit

through tactics such as R&D tax credits, prizes, innovation incubators, subsidies for green innovation, renewable portfolio standards, renewable energy auctions, government procurement of green technologies, and policies that de-risk green investments (e.g. feed-in-tariffs and contract-for-differences such as the type implemented in the UK power sector). Municipal governments can also direct capital and create incentives for green innovation through, for example, establishing low-carbon zones in cities, providing tax-cuts for electric vehicle purchases, issuing (legitimately) green bonds, and setting high energy efficiency standards for buildings and appliances.

In many cases, countervailance comes with the political advantage of bypassing direct confrontation with the CCCM lobby.² Unlike a carbon tax or climate lawsuit, which would involve head-on confrontation with the CCCM lobby, countervailance involves enacting a portfolio of policies to support innovation in low-carbon alternatives and facilitate greater uptake of such solutions. This may naturally reduce the business case for carbon-intensive corporations.

Countervailance tactics aimed at facilitating green innovation can have particularly salient impacts. When technologies are nascent, markets are reluctant to finance innovation even if the social benefits may be high (this is due to a host of market failures including credit constraints, asymmetric information, and imperfect appropriability) (Arrow 1972). Public intervention at the early stages can provide the necessary push to ensure private players fund important solutions. After initial support, positive feedback loops kick-in which trigger a virtuous cycle of more production, more learning, lower costs, and higher demand. Countervailance, therefore, taps into the ubiquitous logic of the market: businesses begin to realise that there are financial gains from switching to promising new technologies which increases the number of green corporations and the profitability of green business models.

As technology cost curves begin to slope downwards, some incumbents may start to feel threatened and ramp up lobbying to discredit the rise of alternative technologies, rather than undertaking the necessary reform. In many countries, this stage has already been reached. A salient example of incumbents feeling threatened is the recent launch of pseudo-scientific report sponsored by Aston Martin that claimed that electric vehicles are far less efficient than once imagined. This claim was thoroughly debunked in a public expose spearheaded by the head of Bloomberg New Energy Finance on LinkedIn, which also revealed that the PR company responsible for the report was headed by the spouse of the head of Government Affairs of Aston Martin.

Another example is that of Germany's feed-in-tariff legislation passed in 2000. It has since been amended four times and virtually removed after incumbents lambasted its costliness and alleged risks to energy security. Although critics did not state it so explicitly, at a fundamental level, the concern was that the feed-in tariff worked "too well" and "too quickly" (Hoppmann, Huenteler, and Girod 2014). One of the authors of the original feed-in tariff law argued that its history would call it the "Birth Certificate of the Solar Age" since it created assured demand for renewable energy that led to increased production and learning-by-doing (Farmer and Lafond 2016).

Countervailance in conjunction with other strategies offers potential answer to such reactionary forces. For example, when complemented with antagonistic strategies such as mass movements to raise climate awareness, there is likely to be an increase in climate-consciousness as citizens see that the transition is not

² Theoretically, while both a carbon tax and green subsidy change the relative price of clean versus dirty technologies, the former is a more politically salient and likely to be resisted.

only affordable but also realise the extent of obstructionist activities and narratives propagated by the CCCM lobby.

Furthermore, the positive feedback of learning-by-doing can overpower political setbacks. Under the Trump Administration, that was openly hostile towards renewable energy and supportive of coal, the cost declines in renewable energy pushed decarbonisation forward. Renewable energy continued to grow in share, even in states that were part of the old hydrocarbon order, such as Texas. As more businesses find it profitable to switch to cheaper and greener technologies, they hydrocarbon business case diminishes, generating additional positive feedbacks in the form of self-reinforcing expectations. Moreover, as green technologies become commercially successful and acquire market share, novel political realignments can emerge (Meckling, Sterner and Wagner 2017). “Politically active tech clusters” can become powerful advocates of stronger climate policies, deter policy backsliding and create windows of opportunities for institutionalist reform (such as the creation of independent commissions to monitor progress on climate change).

An instructive example occurred in Denmark after a centre-right coalition government abandoned several renewable energy commitments in the late 1990s. Vestas, the country’s largest wind turbine manufacturer, threatened to leave Denmark and take their suppliers. Vestas formed an ad hoc green lobbying coalition within the Danish Board of Industry, which included Rockwool (insulation material manufacturer), Danfoss (heating and cooling), Grundfos (gas boilers and pumps), Siemens (wind turbines), VELUX (solar panels and roof windows), Novo Nordisk (healthcare), Novosines (biofuels), and DONG Energy (electric utility). Each of these companies had benefitted from government policies to support energy efficiency and renewable energy. The government quickly learnt that it was in its interests to heed to the demands of the green business coalition because, among other realities, renewable energy was quickly becoming a major source of the country’s export revenue.³ The coalition government re-instated various support measures for the wind industry, admitting that they had underestimated the sentiments of big green businesses.

In this way, the aspiration of green businesses not to lose market share is scarcely different from that of fossil fuel incumbents. The ability of countervailance to invigorate a green lobby is a positive feedback dynamic that can safeguard gains in climate policy.

Co-optation

Co-optation is a highly individualized strategy carried out by tactful reformers with privileged access to elite centres of power. Co-opters try to win over the “hearts and minds” of obstructionists, and persuade businesses or public institutions to become allies of the climate movement. The theory of change is based on the idea that by convincing a relatively small number of elite individuals, such as the CEOs of large, energy-intensive companies or top government officials, great sums of capital can be reallocated away from climate-forcing assets.

Compared to the other strategies in our typology, co-optation is available to relatively few members of the climate movement, and perhaps for this reason, many groups tend to discount its potential. The strategy of co-optation can be adopted by climate-conscious employees within carbon-intensive industries,

³ In the 1990s, Denmark had become a net energy exporter and controlled two-thirds of the global wind turbine market, despite being a small country of less than five million inhabitants.

shareholder activists, family members or friends of board members, high profile advisors and academics, and climate-conscious individuals of high stature or moral authority. For example, an iconic example of co-optation is Pope Francis convening top oil & gas executives to the Vatican to exert his moral authority on CEOs to take action against climate change. Co-optation is likely to be a strategy of choice in contexts where ordinary citizens have relatively less bargaining power compared to corporations (e.g. corporatist oligarchies).

Co-opters can bring about a number of different changes within business organisations that include: commitments to stop funding CCCM lobby groups; linking executive pay to measurable emissions reductions; adopting internal carbon pricing; committing to deforestation-free commodity supply chains; and investing more in green innovation. Increasingly, elite members of society are engaging in shareholder activism to hold oil & gas supermajors accountable (this is an example of a tactic where depending on the style it may be antagonistic or co-opting).

Co-opters navigate the art and politics of persuasion, and their required skillset is not unlike that of an effective politician. Beyond access to elite networks and corridors of power, the successful co-opter tends to be stolid, pragmatic, and careful not to alienate those who they wish to persuade. For the most part, when addressing incumbents, co-opters tend to avoid sententious platitudes (unless they are of exceptionally high stature like Pope Francis). This does not mean that co-opters are moral relativists who lack conviction; to the contrary, many have strong scruples and care passionately about climate change but simply wish to make the most of their privileged position and avoid certain rigidities that could spoil their mission.

However, the co-opter who conforms *entirely* to the social mores of the organization they wish to reform risks being the one who is actually co-opted. Both co-opter and co-opted are elites who agree to interact in the same social and institutional milieu; the essential quality that distinguishes them is that the co-opter is more skilled at identifying the right time to intervene to advance one's agenda.

Since co-optation deals fundamentally in the art of persuasion, its intellectual foundations can be traced back to the ancient Greek concept of *kairos* which denotes "adaptation and accommodation" as well as "timeliness" (Pierson 2000). In Renaissance political philosophy, Machiavelli and other writers evoke *kairos* as a rhetorical theory of "when and how to say things".

Looking ahead, strategists of co-optation could move beyond attempts to persuade hydrocarbon businesses and start building new alliances with businesses in sectors that have been largely overlooked in climate policy but can play a pivotal role in precipitating change. Google, Amazon, Facebook and other technology companies have recently announced plans to eliminate or neutralize their carbon footprints from Scope 1 through Scope 3 emissions. These companies have market-moving power and their actions across supply chains, data centres, and global distribution networks could amplify net-zero efforts in other areas of the economy. Co-opters can hold such companies to their promises, ensure their net-zero plans are not undermined by faulty carbon offsets, and find new firms and business associations with similar recruitment potential. Perhaps most importantly, since such companies have unique political clout in Washington and other political capitals of the world, efforts to turn them into proactive lobbyists⁴ for climate action rather

⁴ Thus, in Equation 1, an increase of G leads to higher α .

than merely passive supporters may tilt the balance of power in gridlocked legislatures such as the US Congress where carbon-intensive incumbents currently control the scales.

4 Heuristic Framework

While the tactics employed by the CCCM lobby have been discussed in the investigative literature, we lack a clear framework for thinking about how the actions of the climate movement influence a politician's incentives to enact stronger climate policy. Developing such a model helps to identify the levers of change and areas of synergies. In this section we introduce a simple heuristic framework to conceptualise a politician's incentives and use it to understand how the five strategies, and the tactics within them, can help enact more stringent climate policy across different institutional settings.

The Politician's Objective Function

A politician selects the level of emissions reduction, x , such that she maximizes the perceived welfare, W , of citizens and business interest groups:⁵

$$W = \underbrace{\alpha(\beta_1 \overbrace{W_P(x)}^{\text{'Pro'}} + \beta_2 \overbrace{W_A(x)}^{\text{'Against'}} + (1 - \beta_1 - \beta_2) \overbrace{W_N(x)}^{\text{'Neutral'}})}_{\text{Citizenry}} + (1 - \alpha) \underbrace{(\phi \overbrace{W_F(x)}^{\text{'Fossil'}} + (1 - \phi) \overbrace{W_G(x)}^{\text{'Green'}})}_{\text{Big business}} \quad (1)$$

$\alpha \in [0,1]$ describes the level of democratisation, i.e. the relative bargaining power of citizens versus that of corporations in the political system.⁶ Subscripts P , A , and N represent citizens that are 'pro', 'against' and 'neutral' vis-à-vis climate policy. The perceived welfare of P citizens increases with greater emissions reduction ($W'_P(x) > 0$), decreases for A citizens ($W'_A(x) < 0$) and remains unchanged for N citizens ($W'_N(x) = 0$). β_1 and β_2 control the distribution of beliefs within the citizenry or how the politician weights them. Corporations are divided into two groups, G and F .⁷ G businesses experience increases in perceived welfare with higher emissions reductions ($W'_G(x) > 0$), while F businesses support the carbon-intensive status quo ($W'_F(x) < 0$). The distribution of corporate interests between G and F or how a politician weights them is determined by $\phi \in [0,1]$.⁸

The politician's objective function features citizens because they supply votes and business interest groups because they supply finance. We assume the politician's chance of election or re-election increases in W .⁹

⁵ We note that x may be interpreted either as an explicit emissions reduction target or the expected outcome of policy.

⁶ 'Consensus democracies' such as those of the Nordic countries, or semi-direct representative democracies such as that of Switzerland, are likely to have a relatively high value of α . Where there is a strong revolving door between industry and government, such as in the United States, α is likely to be lower. In China, where citizens cannot vote but still play a role insofar as they can leverage implicit threats of civil disobedience or revolt, α is likely to be even lower (state-owned enterprises play a far greater role in national policy decisions).

⁷ We use the terms 'corporations' and 'business interest groups' interchangeably. 'Corporations' refers not only to large publicly traded companies but to all firms, industry associations, and business groups which engage in political activity.

⁸ For simplicity we assume there is no neutrality for firms in relation to how perceived welfare will change in response to climate ambition. This can be modelled but it will not change the core conclusions.

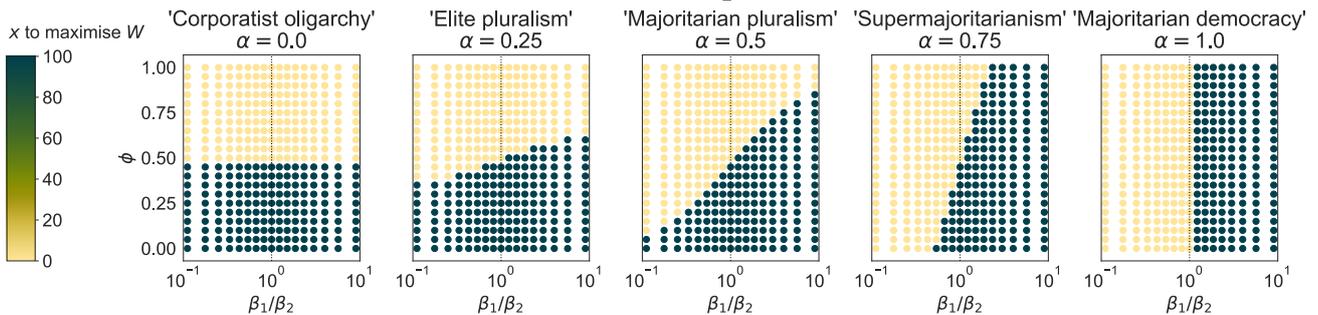
⁹ In the case of countries without democratic elections, this can be rephrased as a politician's "ability to retain power".

Citizens and corporate interests are considered separately to capture numerous cases of divergent interests. Neutral citizens are included to model common phenomena in opinion dynamics, that is, it is more likely for citizens to switch to or from a neutral stance relative to switching across extreme views.¹⁰

We focus on *perceived* welfare because the “true” level of welfare an agent experiences in response to different emissions scenarios may differ from how the agent perceives the matter *ex ante*. This may be due to informational asymmetries (Druckman and McGrath 2019), motivated reasoning, biases relating to elite cues or social milieus (Hart and Nisbet 2012; Gabel and Scheve 2007; Mildemberger and Tingley 2017; Kaufmann *et al.* 2017), and biased media consumption (Feldman *et al.* 2014). The politician may also misjudge citizens’ or firms’ perceptions of their own welfare for the same reasons.

Figure 2 demonstrates how a politician’s incentives to reduce emissions changes in *green industrial incentives* (ϕ), the *level of democratisation* (α), and *climate-consciousness* (β_1/β_2). On the extreme left panel of Figure 2, we see that in a ‘pure’ corporate oligarchy ($\alpha = 0$), the incentive to reduce emissions is invariant to changes in the relative beliefs held by citizens (β_1/β_2). The only parameter that matters is ϕ . If $\phi > 0.5$, the politician is incentivised to reinforce the pollution-intensive status quo (yellow bubbles). On the other end of the spectrum is a majoritarian democracy ($\alpha = 1$). In this case if the majority of citizens is in favour of climate action ($\beta_1/\beta_2 > 1$), the politician is incentivised to reduce emissions (blue bubbles) regardless of the value of ϕ . The panels in between show middle-ground scenarios.

Figure 2. Incentive to Reduce Emissions as a Function of Political Regime Type and Balance of Interest Groups



Note: Colour-coded values in the five sub-plots correspond to a politician’s overall propensity to reduce emissions. For simplicity, estimates from the simulation are restricted to either the maxima or minima of emissions abatement, where the minimum is always zero. Negative values denoting a propensity to increase emissions are also possible, but not considered here. On the considerations informing our choice of terminology in the panel titles, we refer the reader to the taxonomical literature exploring political regime types and the policy decision criteria (relating to citizens’ vs. corporate welfare) implied by different regime types: corporate oligarchy (Winters 2011), elite vs. neutral pluralism (Gilens and Page 2014), and supermajoritarianism vs. neutral democracy (Ganghof 2013).

Figure 2 demonstrates that: (i) in systems where citizens have more bargaining power than corporations (high α), tactics that change citizens’ beliefs (antagonism) and which compensate “losers” (appeasement) can be powerful; (ii) where corporate interests are stronger (low α), tactics that involve increasing corporate incentives to adopt climate-compatible business models (co-optation, institutionalism, and countervailance) or abandon

¹⁰ For example, awareness-building social movements are most successful when they tap into the large and latent pool of citizens with neutral views and effectively recruit them into the ‘pro’ camp.

carbon-intensive business models (antagonism) are likely to be effective; and (iii) changing α itself may be necessary in contexts where a corporate CCCM lobby disproportionately exerts influence against the will of a climate conscious citizenry. Antagonistic or institutionalist measures that give citizens more bargaining power could be considered in these cases. Table 1 further details how the choice of strategy depends on these institutional parameters.

Table 1. The Sensitivity of Strategies to Initial Conditions

Initial Conditions <i>If:</i>	Goal <i>Then:</i>	Tactic <i>By:</i>
1. Citizens have at least as much political influence as corporations over policy ($\alpha \geq 0.5$), but there are more citizens who are 'against' rather than 'pro' ambitious climate policy ($\beta_2 > \beta_1$)	Increase (β_1/β_2) , the ratio of citizens who are 'pro' climate policy to those who are 'against'	Awareness campaigns and pro-climate grassroots movements such as Fridays for Future, Sunrise Movement, and Extinction Rebellion (<i>antagonism</i>) to induce switch from: A to N ; N to P ; or A to P . The switch away from A can also be enabled through financial compensation to the 'losers' (<i>appeasement</i>)
2. Corporations have at least as much political influence as citizens over policy ($\alpha \leq 0.5$), but F firms have more political influence than G firms ($\phi > 0.5$). Citizens that are pro climate policy are greater in number and political influence than those who are against it ($\beta_1 > \beta_2$)	Decrease ϕ , the political influence of F firms, relative to that of G firms ($1 - \phi$)	(a) Pressuring F firms to overhaul their business model and become G firms via <i>co-optation</i> (b) Putting F firms out of business via <i>antagonism</i> (climate lawsuits and reputational damage) (c) Making conditions more favorable for G firms relative to F firms through <i>countervailance</i> (e.g. support for green technologies) (d) Buying the silence and cooperation of F firms through financial compensation (<i>appeasement</i>) (e) Enacting institutional reforms, including carbon pricing and mandatory disclosure of risks, that incentivize F corporations to become G firms.
3. Politicians disproportionately weight the welfare of citizens who are 'against' climate policy than those who are 'pro' ($\beta_2 > \beta_1$) even though in absolute terms there are more citizens who support climate action $P > A$.	Increase (β_1/β_2) , the ratio of the political influence of citizens who are 'pro' climate policy to that of citizens who are 'against' – in other words, empower the "silent majority"	(a) Persuading politicians that the public overwhelmingly supports ambitious climate policy (<i>antagonism</i>) (b) Making it a liability for politicians to discount the perceived welfare and preferences of the of citizens (<i>antagonism; institutionalism</i>)
4. Corporations have at least as much political influence as citizens over policy ($\alpha \leq 0.5$) and there are at least as many G firms than are F ($G \geq F$), but politicians underestimate their potential welfare gains ($\phi > 0.5$)	Decrease ϕ , the weight politicians put on F firms, relative to that of G firms ($1 - \phi$)	(a) Persuading politicians, financiers and businesses that G firms produce greater long-term economic growth and prosperity than F firms (<i>antagonism; co-optation</i>) (b) Making it an electoral liability for politicians to privilege the welfare of F firms at the expense of G firms via <i>institutionalism</i> .
5. Corporations have at least as much political influence as citizens over policy ($\alpha \leq 0.5$), 'F firms outweigh G firms in both size and political influence ($F > G$ and $\phi > 0.5$), but most citizens favor ambitious climate policy ($P > A$).	Increase α , the political influence of citizens relative to that of corporations ($1 - \alpha$)	(a) Reforming public institutions to improve the quality of democracy through <i>institutionalism</i> (b) Making it an electoral liability for politicians to privilege the welfare of corporations at the expense of the welfare of the citizenry through <i>antagonism</i>

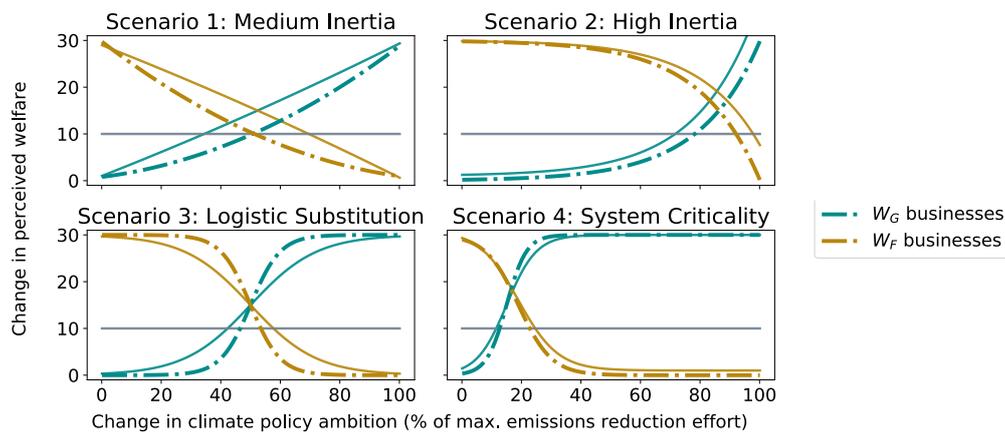
5 System-level change

In this final section, we consider how these strategies may dynamically shift the system. We first outline different plausible states of socio-technical, economic, political and financial systems (Figure 3) and then simulate politicians' choices based on Equation 1 and potential pathways towards effective decarbonisation (Figure 4).

Figure 3 shows how the perceived welfare of G and F corporate interest groups may change in response to climate policy ambition. Scenario 1 shows “medium inertia” where a $\geq 50\%$ increase in climate policy ambition causes the perceived welfare of businesses who adapt to climate change (G corporations) to exceed that of businesses who prefer the fossil fuel paradigm (F corporations). Scenario 2 portrays “high inertia” where it takes a 90% increase in ambition to signal the same shift. Scenario 3 shows “logistic substitution” where at a 50% increase in ambition there is a dramatic surge in the perceived welfare of G corporations and a steep drop for F businesses (exceeding the changes in Scenario 1). Scenario 4 represents “system criticality” where just a small nudge ($<20\%$ more ambition) achieves the same dramatic surge in W_G and drop in W_F .

High levels of criticality could occur due to network effects, bandwagon dynamics, increasing returns to scale and catalytic cooperation (Hale 2020). The concept of “sensitive intervention points” (SIPs) relies on identifying systems that are in state of “criticality” (Farmer *et al.* 2019). Initial scholarship has hypothesised that some tactics under antagonism such as climate lawsuits (Rafaty, Srivastav, and Hoops 2020), and others under institutionalism such as the mandatory disclosure of climate risks, may catalyse this type of change due to their ability to trigger positive feedback loops in systems that are close to criticality (Farmer *et al.* 2019).

Figure 3. Perceived Welfare of Different Interest Groups as a Function of Climate Policy Ambition – Four Hypothetical Scenarios



As a final illustration of how our heuristic framework may inform real-world strategy, Figure 4 takes the perspective of the climate strategist and considers potential SIPs. We assume a “Medium Inertia” scenario. Dark green bubbles correspond to solutions in the state space where the politician pursues emissions reduction. The arrows indicate “paths of least resistance”, moving from a state where climate policy ambition is improbable to one where a politician has strong incentives to pursue higher emissions reductions, x .

Starting from position 1 in Corporatist Oligarchy, where the relative beliefs of citizens are tilted *against* stronger climate policy, the strategist will likely have greater success in increasing the weight of G business interests relative to F interests (i.e. lowering ϕ) as opposed to than democratising the system towards $\alpha=0.25$. This can be done through *co-optation* to convince F businesses that there is more profit in being green or via *countervailance* to prop up the market for green technologies. Democratizing the system without shifting citizens' beliefs will stall the climate movement's agenda since most citizens oppose more ambitious climate action. (Democratization is best considered after *appeasement*, which increases $\beta_1/\beta_2 > 1$).

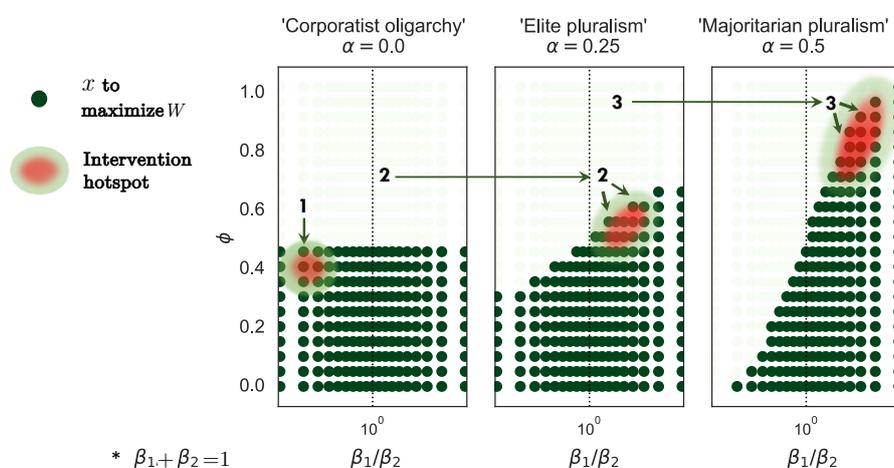
However, if we move to position 2 in Corporatist Oligarchy, where the weight on F business groups is very high but citizens' preferences are tilted in favour of stronger climate ambition then the strategist may find it easier to pursue structural political reforms to raise the voice of citizens (i.e. bring α to 0.25) relative to doing anything antagonistic that directly upsets a very powerful CCCM lobby. If the politician can successfully put limits on corporate campaign contributions (a tactic within *institutionalism*), the system shifts to Elite Pluralism and we arrive at an "intervention hotspot" where a politician has much stronger incentives to support greater emissions reductions because the voice of climate-conscious citizens has more weight.

Similarly, for a strategist in position 3 in Elite Pluralism, F business interests outweigh those of G corporations, and most citizens' are in favour of stronger climate policy. In this setting, antagonistic action to challenge F corporations will likely face direct backlash. Again, what may be more effective is pursuing further democratization through institutional reform (i.e. increasing α to 0.5) to move to a Majoritarian Democracy where climate-conscious citizens can form assemblies and garner more political influence to persuade politician's to ramp up climate ambition even further. This illustrates the synergies between institutionalism and antagonism.

As one can see, the choice of strategy very much depends on the initial conditions and bifurcation points can quickly occur. The US arguably reached such a bifurcation point when the administration changed from that of Trump's to Biden's. If political strategists are astute, this moment can be leveraged to pass through legislative reforms that lock-in stronger climate ambition by for example, fundamentally reforming the system such that more weight is given to the concerns of climate conscious citizens and corporations.

As such, notions of SIPs and system criticality underscore the need to conceptualize political time as nonlinear and discontinuous. This ties back to the work of political thinkers such as Plutarch and Machiavelli who emphasize that effective political strategists must always keep an eye out for a new opening ("system criticality") to execute a strategy to their advantage.

Figure 4. Sensitive Intervention Points, Scenario 1 ("Medium Inertia")



Note: Colour-coded values displayed in the five sub-plots correspond to a politician's overall *propensity* to reduce emissions. For simplicity, estimates from the simulation are restricted to either the maxima or minima of

emissions abatement, where the minimum is always zero. Negative values denoting a propensity to *increase* emissions are also possible, but not considered here.

A great many windows of opportunity are bound to emerge, but to galvanise their nonlinear potential and trigger sensitive intervention points, strategists must persuade those who block change, or else fundamentally shift the systems in which their opponents operate. In our view, the evidence and framework presented in this paper suggest that this will inevitably require a *convergence* of strategies, each pursued by different actors with different ontologies but nevertheless united in a common aim to facilitate the net-zero transition.

References

- Aklin, M. and Mildenberger, M. 2020. Prisoners of the wrong dilemma: why distributive conflict, not collective action, characterizes the politics of climate change. *Global Environmental Politics*, 20(4): 4-27.
- Aklin, M. and Urpelainen, J. 2013. Political competition, path dependence, and the strategy of sustainable energy transitions. *American Journal of Political Science*, 57(3): 643-658.
- Ard, K., Garcia, N. and Kelly, P. 2017. Another avenue of action: an examination of climate change countermovement industries' use of PAC donations and their relationship to Congressional voting over time. *Environmental Politics*, 26(6): 1107-1131.
- Arrow, K.J. 1972. Economic welfare and the allocation of resources for invention. In *Readings in industrial economics*. Palgrave, London: 219-236.
- Bacon, W. 2013. Sceptical Climate Part 2: Climate Science in Australian Newspapers. *Australian Centre for Independent Journalism*: 1-222.
- Bertrand, M., Bombardini, M., Fisman, R., and Trebbi, F. 2020. Tax-Exempt Lobbying: Corporate Philanthropy as a Tool for Political Influence. *American Economic Review*, 110 (7): 2065-2102.
- Blanes i Vidal, J., Draca, M., and Fons-Rosen, C. 2012. Revolving Door Lobbyists. *American Economic Review*, 102 (7): 3731-48.
- Brulle, R.J. 2014. Institutionalizing delay: foundation funding and the creation of US climate change counter-movement organizations. *Climatic change*, 122(4), 681-694.
- _____. 2018. The climate lobby: a sectoral analysis of lobbying spending on climate change in the USA, 2000 to 2016. *Climatic Change*, 149(3): 289-303.
- Burke, J. 2015. Greenpeace bank accounts frozen by Indian government. [online] *The Guardian*. Accessed: 04 November 2020.
- Carton, W. (2020). Carbon unicorns and fossil futures. Whose emission reduction pathways is the IPCC performing? In: Sapinski, J.P., Buck, H., Malm, A. (eds.), *Has it come to this? The promises and perils of geoengineering on the brink*. Rutgers University Press.
- Chamon, M. and Kaplan, E. 2013. The iceberg theory of campaign contributions: Political threats and interest group behavior. *American Economic Journal: Economic Policy*: 1-31.
- Clark, C.E. and Crawford, E.P., 2012. Influencing climate change policy: The effect of shareholder pressure and firm environmental performance. *Business & Society*, 51(1), pp.148-175.
- Colgan, J., Green, J.F. and Hale, T. 2020. Asset revaluation and the existential politics of climate change. *International Organization*: 1-25.
- Cullenward, D. and Victor, D.G. 2020. *Making Climate Policy Work*. John Wiley & Sons.

- Dal Bó, E. and Di Tella, R. 2003. Capture by threat. *Journal of Political Economy*, 111(5): 1123-1154.
- DellaVigna, Stefano, Ruben Durante, Brian Knight, and Eliana La Ferrara. 2016. Market-Based Lobbying: Evidence from Advertising Spending in Italy. *American Economic Journal: Applied Economics*, 8 (1): 224-56.
- Douglass, F. 1979. *The Frederick Douglass Papers: 1855-63*. New Haven, CT: Yale University Press.
- Downs, A. 1957. An economic theory of political action in a democracy. *Journal of Political Economy*, 65(2): 135-150.
- Druckman, J.N. and McGrath, M.C. 2019. The evidence for motivated reasoning in climate change preference formation. *Nature Climate Change*, 9(2): 111-119.
- European Commission 2021. State aid: Commission opens in-depth investigation into compensation for early closure of lignite-fired power plants in Germany. Press Release. 2 March. Brussels.
- Farmer, J.D., Hepburn, C., Ives, M.C., Hale, T., Wetzer, T., Mealy, P., Rafaty, R., Srivastav, S. and Way, R. 2019. Sensitive intervention points in the post-carbon transition. *Science*, 364(6436): 132-134.
- Farmer, J.D. and Lafond, F., 2016. How predictable is technological progress?. *Research Policy*, 45(3), pp.647-665.
- Farrell, J. 2016. Corporate funding and ideological polarization about climate change. *Proceedings of the National Academy of Sciences*, 113(1): 92-97.
- Feldman, L., Myers, T.A., Hmielowski, J.D. and Leiserowitz, A. 2014. The mutual reinforcement of media selectivity and effects: Testing the reinforcing spirals framework in the context of global warming. *Journal of Communication*, 64(4): 590-611.
- Finnegan, J. 2019. Institutions, climate change, and the foundations of long-term policymaking. Centre for Climate Change Economics and Policy Working Paper 353/Grantham Research Institute on Climate Change and the Environment Working Paper 321. London: London School of Economics and Political Science
- Gabel, M. and Scheve, K. 2007. Estimating the effect of elite communications on public opinion using instrumental variables. *American Journal of Political Science*, 51(4): 1013-1028.
- Ganghof, S. 2013. Does public reason require super-majoritarian democracy? Liberty, equality, and history in the justification of political institutions. *Politics, Philosophy & Economics*, 12(2): 179-196.
- Gershkovich, E. 2019. How does a powerful Russian lobby plan to halt climate change? With coal, oil and gas. [online] *The Moscow Times*, 15 November.
- Gilens, M. 2012. *Affluence and influence: Economic inequality and political power in America*. Princeton, NJ: Princeton University Press.
- Gilens, M. and Page, B.I. 2014. Testing theories of American politics: Elites, interest groups, and average citizens. *Perspectives on Politics*, 12(3): 564-581.

- Hale, T. 2020. Catalytic cooperation. *Global Environmental Politics*, 20(4): 73-98.
- Hart, P.S. and Nisbet, E.C. 2012. Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication research*, 39(6): 701-723.
- Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J. and Zenghelis, D., 2020. Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?. *Oxford Review of Economic Policy*, 36(Supplement_1), pp.S359-S381.
- Hoppmann, J., Huenteler, J. and Girod, B. 2014. Compulsive policy-making—The evolution of the German feed-in tariff system for solar photovoltaic power. *Research policy*, 43(8): 1422-1441.
- Jahn, D. 2016. *The politics of environmental performance*. Cambridge, UK: Cambridge University Press.
- Jakob, M., Steckel, J.C., Jotzo, F., Sovacool, B.K., Cornelsen, L., Chandra, R., Edenhofer, O., Holden, C., Löschel, A., Nace, T. and Robins, N. 2020. The future of coal in a carbon-constrained climate. *Nature Climate Change*, 10(8): 704-707.
- Kaufmann, R. K., Mann, M. L., Gopal, S., Liederman, J. A., Howe, P. D., Pretis, F., ... & Gilmore, M. 2017. Spatial heterogeneity of climate change as an experiential basis for skepticism. *Proceedings of the National Academy of Sciences*, 114(1): 67-71.
- Kiernan, B. 1992. The Vietnam War: Alternative endings. *The American Historical Review*, 97(4): 1118-1137.
- Kim, S.E. and Urpelainen, J. 2017. The polarization of American environmental policy: A regression discontinuity analysis of Senate and House votes, 1971–2013. *Review of Policy Research*, 34(4): 456-484.
- Kumar, C. 2020. Amnesty India: Amnesty International halts India operations citing government 'witch-hunt'. [online] *The Times of India*. Accessed: 04 November 2020.
- Lahiri-Dutt, K. 2016. The diverse worlds of coal in India: Energising the nation, energising livelihoods. *Energy Policy*, 99: 203-213.
- Leipprand, A. and Flachsland, C. 2018. Regime destabilization in energy transitions: The German debate on the future of coal. *Energy Research & Social Science*, 40: 190-204.
- Leiren, M.D. and Reimer, I. 2018. Historical institutionalist perspective on the shift from feed-in tariffs towards auctioning in German renewable energy policy. *Energy Research & Social Science*, 43: 33-40.
- Leonard, C. 2019. *Kochland: The secret history of Koch industries and corporate power in America*. Simon & Schuster.
- Markard, J. and Rosenbloom, D. 2020. Political conflict and climate policy: the European emissions trading system as a Trojan Horse for the low-carbon transition? *Climate Policy*: 1-20.

- Meckling, J., Sterner, T. and Wagner, G., 2017. Policy sequencing toward decarbonization. *Nature Energy*, 2(12), pp.918-922.
- Meckling, J. 2019. Governing renewables: Policy feedback in a global energy transition. *Environment and Planning C: Politics and Space*, 37(2): 317-338.
- Meng, K.C. and Rode, A. 2019. The social cost of lobbying over climate policy. *Nature Climate Change*, 9(6): 472-476.
- Mercure, J.F., Pollitt, H., Viñuales, J.E., Edwards, N.R., Holden, P.B., Chewpreecha, U., Salas, P., Sognaes, I., Lam, A. and Knobloch, F. 2018. Macroeconomic impact of stranded fossil fuel assets. *Nature Climate Change*, 8(7): 588-593.
- Mildenberger, M. 2020. *Carbon captured: How business and labor control climate politics*. Cambridge, MA: MIT Press.
- Mildenberger, M. and Tingley, D. 2017. Beliefs about climate beliefs: the importance of second-order opinions for climate politics. *British Journal of Political Science*, 49(4): 1279-307.
- Myers, T.A., Maibach, E.W., Roser-Renouf, C., Akerlof, K. and Leiserowitz, A.A., 2013. The relationship between personal experience and belief in the reality of global warming. *Nature climate change*, 3(4): 343-347.
- Nandi, J. 2020. 3 green youth movements allege digital censorship. [online] *Hindustan Times*. Accessed: 04 November 2020.
- Oreskes, N. and Conway, E.M. 2011. *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. Bloomsbury Publishing USA.
- Pierson, P. 2000. Increasing returns, path dependence, and the study of politics. *American political science review*: 251-267.
- Rafaty, R., 2018. Perceptions of corruption, political distrust, and the weakening of climate policy. *Global Environmental Politics*, 18(3):106-129.
- Rafaty, R. 2017. *Determinants of climate policy stringency in the industrialized democracies*. PhD thesis, Department of Politics and International Studies, University of Cambridge.
- Rafaty, R., Srivastav, S. and Hoops, B. 2020. Revoking coal mining permits: an economic and legal analysis. *Climate Policy*: 1-17.
- Robinson, E. and Robbins, R.C. 1968. Sources, abundance, and fate of gaseous atmospheric pollutants. Final report and supplement.
- Rochedo, P.R., Soares-Filho, B., Schaeffer, R., Viola, E., Szklo, A., Lucena, A.F., Koberle, A., Davis, J.L., Rajão, R. and Rathmann, R. 2018. The threat of political bargaining to climate mitigation in Brazil. *Nature Climate Change*, 8(8): 695-698.

- Skovgaard, J. and van Asselt, H. (eds.). 2018. *The politics of fossil fuel subsidies and their reform*. Cambridge, UK: Cambridge University Press.
- Stokes, L.C. 2020. *Short circuiting policy: Interest groups and the battle over clean energy and climate policy in the American States*. New York, NY and Oxford, UK: Oxford University Press.
- Tong, D., Zhang, Q., Zheng, Y., Caldeira, K., Shearer, C., Hong, C., Qin, Y. and Davis, S.J., 2019. Committed emissions from existing energy infrastructure jeopardize 1.5 C climate target. *Nature*, 572(7769), pp.373-377.
- Vesa, J., Gronow, A. and Ylä-Anttila, T. 2020. The quiet opposition: How the pro-economy lobby influences climate policy. *Global Environmental Change*, 63: 102117.
- Wettengel, J. 2020. Spelling out the coal exit – Germany’s phaseout plan. *Climate Energy Wire*.
- Winters, J.A. 2011. *Oligarchy*. Cambridge, UK: Cambridge University Press.
- Yergin, D. 2011. *The prize: The epic quest for oil, money & power*. Simon and Schuster.