

Corporate ‘Capture Strategies’ Impacting Human and Ecosystem Health

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Cite This: <https://doi.org/10.1021/acs.estlett.5c00277>



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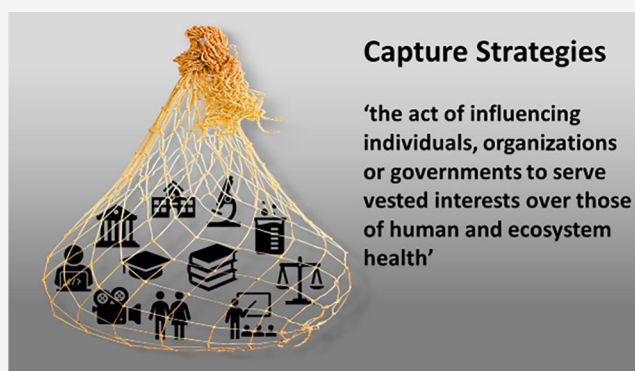
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ABSTRACT: The concept of regulatory capture has been extensively studied in academic literature, primarily within the social sciences. This phenomenon has been increasingly discussed in the environmental sciences as the impacts of regulatory capture on human and ecosystem health have become increasingly apparent. Regulatory capture is just one tactic employed by vested interests in the strategy of delaying, weakening, or abolishing policies designed to protect the public interest. Here, we define capture strategies as ‘the act of influencing individuals, organizations, or governments to prioritize corporate interests over those of human and ecosystem health’. Similar to the evolution of terms like whitewashing and greenwashing into the broader concept of colorwashing, this new definition expands the scope of capture to include a wide range of targets, such as individuals, educational institutions, nongovernmental organizations, media, and local, national, and intergovernmental organizations. By broadening the definition, we anticipate that researchers, policymakers, and civil society will find it easier to identify and prevent such nefarious activities. This paper illustrates how ‘capture strategies’ have played, and (unless kept in check) will continue to play, an instrumental role in obstructing efforts to address the triple planetary crises of climate change, biodiversity loss, and chemical pollution.

KEYWORDS: Capture, disinformation, polluting industries, greenwashing, conflicts of interest



BACKGROUND

For over 80 years, academic scholars have documented how regulators are influenced by the entities they are tasked with regulating, often at the expense of the public they are meant to serve, and the environment they are meant to protect.^{1,2} This phenomenon, commonly referred to as ‘regulatory capture’ or ‘agency capture’ and attributed to Stigler,³ was defined by Shapiro⁴ as occurring when ‘regulated entities have substantial influence over policymaking’. The study of regulatory capture has historically been the domain of economists, who have documented case studies worldwide across diverse industries.^{5,6} More recently, environmental scientists have started to examine these practices due to their significant ability to restrict societal efforts devoted to protecting human and ecosystem health.^{7,8}

Entities (e.g., industries) with vested interests and their lobbyists frequently employ tactics to capture policies that are meant to protect the public interest. Here, we define an entity with a vested interest as having a direct material gain in an action or process. The study of capture is important as entities with vested interests have led to systemic prioritization of profits over human and ecosystem health, employing a variety

of strategies often referred to as the ‘industry playbook’.^{9,10} Shapiro highlights that the concept of regulatory capture is varied, as some focus on the process while others focus on the consequences. A regulatory agency is ‘captured’ when a regulated entity has substantial influence over policymaking.⁴ The consequence of that capture is that the ‘captured’ regulatory agency no longer serves the public interest but rather serves those with a vested interest. Activities that fall under “capture” are complicated by the nuance as to what is the public interest.^{4,11} An example of an instance and outcome of capture is the Deepwater Horizon oil spill disaster. It was estimated to have leaked 4.9 million barrels of oil into the Gulf of Mexico, with long-lasting detrimental effects on human and ecosystem health. It can exemplify regulatory capture, due to

Received: March 25, 2025

Revised: September 2, 2025

Accepted: September 2, 2025

Table 1. Overview of Agencies and Actors Affected by Capture Tactics of Corporate Vested Interests and Their Lobbyists, with a Focus on Those Influencing Decisions Related to Human and Ecosystem Health

Type of capture	Explanation
Capture of Governance	• Intergovernmental capture can occur when businesses and governments with vested interests deliberately stymie the progress of intergovernmental meetings so that decision-making is stalled or jeopardized, which might otherwise impact economic growth and corporate profits.^{20,21} • Government capture is when corporate and government interests align. For example, when international regulation might stymie the GDP of a country known to profit from resource extraction and/or production of harmful products such as asbestos, pharmaceuticals or tobacco. Alternatively, when a government is not critical of corporate practices as a result of past failures in governance to protect the public good.^{2,48,49} • Local government capture occurs when a local authority with devolved responsibilities is unduly influenced by vested interests. These may be quite variable between countries depending on the degree to which governance is devolved.^{50,51} • Quasi-autonomous nongovernmental organizations (QUANGOs) or Arm's Length Bodies (ALB) capture are organizations to which a government has devolved power, but which are still partly controlled and/or financed by government bodies. Capture can come in the form of government-appointed/approved leadership positions, controlled statutory roles, controlled funding and strictly controlled publication/interpretation of public data.^{52,53} • Politician capture: Wealth inequality resulting in disproportionate ability for corporations and their lobbyists to gain influence over individual politicians. There are many examples across a wide range of industries, including oil, tobacco and gambling.^{22,23,54} • Regulatory capture is when a regulatory agency, mandated to oversee and enforce rules to protect the public interest, is unduly influenced by vested interests that it is meant to keep an eye on. Regulators are encouraged to use "self-reported" data and dissuaded from using independent data. Global examples across multiple industries.^{2,5,6,55,56} • Standards organization capture occurs when a chemical industry influences the purportedly independent organizations responsible for setting standards or their methods to the extent that industry standards are lowered, or prevented from being elevated. Examples include the biasing of standards and methods to favor the use of specific products or chemicals (e.g., the use of flame retardants to meet a specific test)^{57,58} • Analytical methods capture occurs when chemical producers prevent the availability of chemical reference standards resulting in hindering independent scientific investigation of the specific chemical toxicology, fate, and environmental exposure.⁵⁹ • University capture occurs when funding-strapped universities are worried about jeopardizing corporate funding and might suppress negative research discoveries or critical researchers.^{26,28,60,61} • School capture occurs when private or public schools accept funding or make use of educational materials from industry. Examples exist from the alcohol and food industries where experts claim the educational materials have been misleading or play down the health effects of products. Past tactics employed by the tobacco industry have also included placing tobacco shops close to schools. More recently, tobacco shops have been replaced by vape shops.^{62,63} • Research institution and 'think tank' capture. Research consortia or "think-tanks" that give the appearance of "neutrality" but are funded by corporate vested interests that use the organization to promote their agenda.^{64,65} • NGO capture can occur when NGOs gain more funding through corporate sponsorships and partnerships than through memberships. Controversial examples include conservation charities accepting funding from the petrochemical industry and other large corporate sponsors.^{36,37,66,67} • Media capture occurs when journalists are constrained by the political affiliation of their newspapers or media organisations. Media organisations are constrained by the vested interests of their owners. Independent journalists are constrained by the need to get contract work with publishers with vested interests.^{42,53,68} • Hollywood capture has known to occur when filmmakers accept funding for product placement in movies and TV shows. Examples include Hollywood funding by the oil and tobacco industries to portray industries in a certain light, engage in product placement or make use of influential actors.^{39–41,69,70} • Culture capture: Mainstream and social media are used to promote misinformation and disinformation. These include ways in which sections of society can be influenced to disbelieve in science. Examples include the deliberate attempts to sow doubt in climate science which might influence public opinions regarding the fossil fuel industry. Similarly, the antivaccine movement has been estimated to generate \$1 billion annual revenues for social media industry.^{2,44,71,72} • Sports capture is the use of high-profile athletes and sports events to promote products. Examples include the use of sugary/stimulant drinks, fossil fuel and tobacco.^{73,74} • Religion capture can occur when religious organisations are unduly influenced by industry and exploited for their influence on society. Many religious organizations have been criticized for having large sums of their pension and endowment funds in fossil fuel companies, which might explain why some religious groups have been proponents of climate denialism.^{72,75,76} • Museum capture can occur when they are increasingly dependent on private sector funding, leading to greenwashing. Corporations can benefit from the 'trusted' public profile of science museums. Examples include funding of museums by the petrochemical industry.^{30–32} • Conference capture can occur when corporate conference sponsors dictate the scope and who or which groups are given a platform.^{77,78} • Learned society capture can occur when learned societies reliant on industry sponsorship are unduly influenced to endorse viewpoints which might negatively impact human and ecosystem health.^{33–35,79,80} • Scientific journal and peer review capture is when industry or affiliated consultancies influence the practice of publication through industry-backed journals and/or industry-appointed editorial boards.⁷⁸ • Academic capture: Academics are silenced through their work with industry, either through nondisclosure agreements or concerns over additional funding in a "get funded or perish" culture.^{81,82}
Regulatory and Regulatory Standards Capture	
Education and Knowledge Capture	
Culture, Media, and Sports	
Scientific Discourse	

the too-close relationship between the regulator and the oil industry, which led to an overreliance on industry data and expertise, resulting in the failure of regulatory oversight.¹² In this instance, the regulator was accused of not strictly enforcing its recommendations for backup systems to underwater control valves and ignoring a repeated series of accidents.¹²

Capture tactics are part of a broader suite of tactics used by corporate interests in the strategy to influence outcomes.^{13,14} Other tactics include sowing doubt, disseminating disinformation and misinformation, denial, and deflection.^{7,8} A large body of research into these tactics spans industries such as tobacco, alcohol, sugar, pharmaceuticals, chemicals, pesticides, mining, energy, water providers and petrochemicals.^{13–15} Frameworks developed by Goldberg and Vandenberg¹⁶ and Legg et al.¹⁴ have been used to assess the extent and similarity of industry tactics. Goldberg and Vandenberg's¹⁶ framework focuses more on public-oriented tactics, while Legg et al.¹⁴ emphasize strategies targeting scientific credibility. Both frameworks highlight 'capture' as a specific subset of direct corporate tactics, whereas other tactics could be seen as a downstream outcome of capture, such as influencing people, organizations or government/regulatory authorities. For example, some strategies identified by Legg et al.,¹⁴ 'Control reporting and suppress publication of unfavorable science', can be an outcome of academic or university capture. Of the 28 tactics described by Goldberg and Vandenberg,¹⁶ a smaller fraction directly relates to 'capture' or 'influence'. Examples include 'Influence government and laws', 'Gain support from reputable individuals', 'Impede government regulation', 'Define how to measure outcome/exposure', 'Develop a PR strategy', and 'Appeal to mass media' (see [Supplementary Tables 1 and 2](#)).

In this paper, we present capture tactics under a single framework within the environmental literature. In doing so, we expand the concept of capture beyond targeted regulatory agencies to encompass a wide range of societal actors. Examination of corporate internal documents from the pharmaceutical¹⁷ and chemical industries¹⁸ has demonstrated a broad range of captures, including scientific, professional, regulatory, media, market, technological and civil society. We review examples of intended capture targets from individuals, research institutions, regulatory agencies, governments, intergovernmental panels, as well as the film industry and media. Thus, we define capture strategies impacting human and ecosystem health as *'the act of influencing individuals, organizations, or governments to serve vested interests over those of human and ecosystem health'*. Our intent follows the argument of Portman¹⁹ who wrote that understanding the commonalities of regulatory capture can help policymakers and watchdog groups identify and counteract these practices. Thus, we propose that educating individuals across disciplines about these wider capture practices can also raise awareness and foster resistance. We also suggest that bringing these capture tactics together under one umbrella term can help to develop a deeper understanding. For example, whitewashing is broadly defined as the attempt to obscure the truth, and distract or make harmful actions and products seem acceptable. When products are promoted as being environmentally friendly or less harmful to the environment it is often referred to as greenwashing. Over time, whitewashing and greenwashing have been grouped under the umbrella as 'colorwashing' to describe similar tactics.

■ CAPTURE STRATEGIES IMPACTING HUMAN AND ECOSYSTEM HEALTH

Table 1 provides an overview of the broad nature of capture tactics implemented by vested interests that could adversely affect human and ecosystem health. A systematic review was not our goal, instead pertinent examples have been chosen to illustrate the broad nature of capture tactics to an environmental audience. Many of these were known to the authors who have studied disinformation tactics and conflicts of interest. Additional examples were identified through literature searching using the type of capture as a search term. Our analysis of these tactics reveals that regulatory authorities are not the only targets of capture. Capture can extend to educational establishments, political parties, local and national governments, intergovernmental organizations, and even individuals. In some cases, capture comes from industries and governments when they share the same material interest. For example, scientists have observed joint attempts by governments and their national corporate lobbyists to stall intergovernmental negotiations around climate change, biodiversity and chemical/plastics pollution.^{20,21} Following observations of capture within intergovernmental meetings such as the Open-Ended Working Group on a Science Policy Panel on Chemicals, Waste, and Pollution Prevention, Schäffer et al.¹³ recently argued that the chemical industry should not be directly involved in the panel's decision making and steps should be taken to prevent the activities of vested interests by imposing strict and robust conflict of interest provisions. The authors proposed that the Science Policy Panel includes an independent auditor to ensure that participation and processes follow strict rules for preventing conflicts of interest.

Capture can also involve an individual's financial interests. For example, politicians receiving campaign donations from corporate actors are known to promote the interests of those sponsors.^{22,23} Furthermore, academics in a 'get published/funding or perish' culture can be attracted to sources of industrial funding. This funding landscape is not 'capture' *per se*, but can create an environment leading to capture. Those academics who have become dependent on industry funding are more reluctant to speak out or publish negative research about sponsoring industry for fear of loss of funding, along with their job security and promotion success. This bias in publishing has been documented in the field of pharmaceutical testing.^{24,25}

Academic scholars can also be reluctant to speak out if their university has been 'captured' by industry funding.²⁶ Educational institutions can be captured through private sector funding that compromises their independence.²⁷ It has been argued that corporate funding can influence decisions not to publish critical material and hamper academic freedom.²⁸ In essence, the concept would mean that university institutes had been captured, like individual academics, by an over-reliance on corporate funding in an environment where public funding was otherwise highly constrained. An example here is 'Frackademia', which was a term coined when a large number of academic institutions received substantial amounts of petrochemical money. These pressures rely on counter-measures such as strong and transparent institutional governance, open data, and academic freedom.

Similarly, museums, which are highly regarded by the public as being centers of credible scientific and cultural information, can also be influenced by their funding sources. But just like

the situation for some academic institutions, public funding has been waning, with some private funding filling the gap.²⁹ For example, science museums have been criticized for accepting fossil fuel sponsorship.^{30,31} In the UK, this criticism of fossil fuel funding led to the National Science Museum not renewing its sponsored exhibits from an energy company.³²

Scholarly societies and conferences can be influenced by corporate sponsorship, which might result in harmful outcomes of their products, services being played down, or critical science/scientists being suppressed.^{33,34} For example, the pesticide industry has come under criticism for sponsoring the Entomological Society of America, which resulted in disproportionately large numbers of corporate conference chairs and few talks on the harmful effects of pesticides.³⁵

Environmental nongovernmental organizations (eNGOs) that lack a predictable and reliable funding base can also be captured by accepting lucrative funding from corporate actors seeking to bolster their image, sometimes prioritizing this support over membership contributions in a competitive NGO market. The World Wildlife Fund (WWF) has previously been criticized for receiving sponsorship from Global corporations such as Coca-Cola, Shell, Monsanto, HSBC, Cargill, BP, Alcoa and Marine Harvest.^{36,37} However, scholars have warned about the problems of confusing capture with alignment or accommodation, resulting in collinearity between eNGOs and corporate actors.³⁸

Culture, media and sports outlets have all been captured in recent history by corporate actors that have a vested interest in profits over the public good. For instance, the Hollywood film industry had strong financial backing from the tobacco industry, which led to product placement and an increased uptake of smoking.^{39,40} Similarly, it has been claimed that the oil industry has influenced the film industry by providing funding in exchange for a more favorable portrayal of the petrochemical industry.⁴¹ Through the financial capture of politicians,^{22,23} and the politicisation of media, these financially vested interests can be used to capture print and broadcast media as well as journalists.^{42,43} Social media platforms are also coming under increasing scrutiny for amplifying disinformation and hampering or abandoning fact-checking, consequently leading to culture capture. Pertinent examples relevant to human and ecosystem health include the rise in climate denial information and high proportions of climate denialism in some countries.^{44–47}

DISCUSSION AND RECOMMENDATIONS

Humanity is facing a triple planetary crisis of climate change, biodiversity loss and pollution.⁸³ The latest UN report on the progress in sustainable development goals (SDGs) gives a bleak assessment of our progress with many of the environmental related indicators⁸⁴ (UN, 2024). Corporate actors have provided many innovative technological solutions to support the health of humans and ecosystems. Companies should be allowed to represent their interest and views in a fair and transparent way. However, corporate actors that necessarily have vested interests can act badly when motivated by profits, geopolitics, and ideologies of inequality. Some deliberately use broad capture tactics to influence individuals, organizations, or governments. These tactics therefore necessitate robust and broad counter strategies and measures.

Within the context of regulatory capture, a number of countermeasures have been proposed, including increased transparency and accountability, increasing publicly funded

resources and expertise, strengthening legal and institutional frameworks, restrictions on ‘revolving door’ opportunities, access by public interest groups, and supporting free and investigative press.^{1,85} In the book ‘Preventing Regulatory Capture’, Carpenter and Moss concluded that capture prevention as an empirical topic should be every bit as important as the study of capture itself.¹ For example, theoretical approaches, such as game theory, have been proposed to address regulatory capture strategies.⁸⁶ These modeling approaches have outlined how stronger regulation and governance, including stricter penalties, can help to mitigate the impacts of regulatory capture.⁸⁶ Under our broader definition of capture, we recommend the following countermeasures as important first steps in mitigating capture:

- 1) Promote strong conflicts of interest (COI) policies across sectors and institutions, thereby making sure delegates, board members, and institutional bodies are transparent about vested interests.
- 2) Ensure financial transparency by enforcing mechanisms that make individuals, institutions, societies and organizations disclose their funding sources.
- 3) Improve regulation and transparency around corporate and political lobbying of public institutions by enforcing records of lobbying, financial transparency and COIs.
- 4) Ensure strong institutional/societal governance by requiring procedures to protect academic freedom and freedom of speech, integrating COIs prevention and research ethics so as not to be unduly influenced by external pressures.
- 5) Promote open data policies by ensuring, where possible, that all data generated from research is openly available for scrutiny and not unnecessarily protected by non-disclosure agreements and intellectual property.
- 6) Incentivize meaningful corporate social responsibility initiatives and enforce human rights.
- 7) Educate and inform on capture strategies by introducing this topic in the higher education curriculum. Foster transdisciplinary studies into capture mechanisms and corporate tactics.

When both corporate and government vested interests align to the extent that they impact intergovernmental decisions, education has an important role in the empowerment of civil engagement. Efforts to educate school children about misinformation and disinformation are underway in many countries.^{87–90} For example, both the United Nations and the European Union have educational materials on their Web sites relating to climate change disinformation, although neither calls out the source and rationale for the disinformation.^{91,92} The United Nations (UN) does acknowledge industry roles in greenwashing in an article entitled ‘Greenwashing – the deceptive tactics behind environmental claims’.⁹³ The UN has also produced a report entitled ‘Integrity Matters’ which highlights that the role of nonstate actors should be lobbying for positive climate action and not against it.⁹⁴ Despite these initiatives, information about disinformation tactics and conflicts of interest remains underrepresented in higher education curricula, particularly within the environmental sciences. For instance, while textbooks on environmental toxicology and ecotoxicology address risk assessment and policy, they fail to discuss their normative underpinnings, which are vulnerable to the tactics and strategies employed by vested interests to manipulate public and scientific discourse.

Therefore, to counter vested interests that threaten the implementation of actions intended to protect ecological and human health, scientists, policymakers, and the general public must increase their awareness of the varying strategies of capture.⁸² Schäffer et al.¹³ emphasized the need for stronger conflicts of interest policies, particularly in relation to intergovernmental science policy panels. Likewise, strong governance structures and conflicts of interest policies are required for higher education institutions, environmental NGOs and museums. We therefore recommend that management boards run scenarios to stress test their organizational structures where competing interests may occur. For example, would an academic institute promote research that exposes human and ecosystem harms resulting from a polluting industry while also trying to secure a lucrative grant from that same industry? Are eNGOs financed through polluting industries less likely to conduct campaigns criticizing their actions or simply stay quiet? Are natural history museums less likely to run education displays highlighting the impacts of climate change or biodiversity loss while receiving funds from fossil fuel companies?

Regulation not only happens at national levels but globally through intergovernmental organizations, such as the United Nations, International Monetary Fund (IMF) and World Trade Organization (WTO).¹¹ There are concerns that there is an 'increasing market concentration and the accumulation of wealth and economic power in the hands of a relatively small number of transnational corporations and ultrarich individuals'.⁹⁵ Some have argued that corporate rights are in some cases stronger and more powerful than civil rights,⁹⁶ which begs the question as to whether there needs to be a rebalancing and enforcement of civil rights, such as the Human rights to a clean, healthy and sustainable environment.⁹⁷ 'Rights' in some nations have started to go beyond humans and corporations to include 'rivers' and environmental habitats.^{98–100} Some have promoted corporate social responsibility as a model for rebalancing the profit incentives of larger corporations although analysis of such models has shown success to be mixed.^{101,102}

An important step toward developing counter-strategies is to see through the fog of misinformation, disinformation, and capture that are used to hide vested interests. Bringing these interests out into the open decreases their efficacy and emboldens a critical public sphere to draw their conclusions, which is key to advancing urgently needed change and action to protect human and ecosystem health.

■ ASSOCIATED CONTENT

SI Supporting Information

The Supporting Information is available free of charge at <https://pubs.acs.org/doi/10.1021/acs.estlett.5c00277>.

Capture strategies mapped against the corporate tactics by Goldberg and Vandenberg¹⁶ and Legg et al.¹⁴ (PDF)

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Notes

The authors declare no competing financial interest.

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