

It may be a mistake to assume that opponents of climate policy will see the handwriting on the wall and gracefully give way to the inevitable. In politics, decisions are rarely made for all time, and agreements between opposing sides may not be enforceable. In such situations, game theorists have proposed [war-of-attrition models](#) for conflicts. In these models, even where one player has a natural advantage over the other, wars of attrition may last a long time.. In a typical model, the war involves fighting a series of battles, the outcomes of which are not wholly predictable. Each player may find it rational to put forth more effort as victory comes closer, because the odds of winning rise, but also to make a last-ditch effort at defense when about to lose because defeat is so costly. No one, in short, is likely to surrender gracefully even when the odds are against them, and the war will only get bloodier as it seems to get closer to the end.

There are situations where a war-of-attrition ends in a negotiated deal which neither side is motivated to break. It seems at least *possible* to imagine such a deal with the oil and gas industry, involving peaking gasoline use and then gradually phasing it out, accompanied by the use of natural gas as a bridge fuel for electricity and research on carbon capture. Carbon capture and sequestration would not only allow indefinite use of gas but would also involve the industry's geological and drilling expertise, giving this outcome some appeal for the industry. So the war of attrition with the oil industry *could* conceivably resolve peaceably. However, one lesson of the models is that even an advantageous-seeming may never take place, because of fear that the other side will not keep to the deal. The industry may well fear that if it makes concessions today, the other side will simply renew the attack, with the industry in a weaker position to resist.

The coal industry's position is more desperate; because there is no obvious bridge from the present to a more remote future where carbon capture will allow continued use of coal. Coal interests also know that almost any mitigation efforts will reduce the economic significance of the industry and hence its political influence. Thus the coal industry's best strategy is to fight with everything it has right now, more or less like the Germans trying to keep the Allies from getting a toehold on Omaha Beach, and then to keep fighting no matter what.

Like game theory generally, war-of-attrition models assume rationality on the part of the players. That's not entirely true of opposition to climate change. There are people who wouldn't believe things were getting warmer even if the heat set their hair on fire. Game theory has nothing to say about how to change these people's minds. But even more rational players may have an interest in mimicking this form

of irrationality in order to convince opponents that they will never give up the fight. As Richard Nixon pointed out long ago, it can be a bargaining advantage to convince others that one is dangerously crazy.

There is a tendency to assume that at some point opposition to climate policy will just fade away. The game theory models suggest, however, that we could be in for a very lengthy period of conflict with entrenched fossil fuel interest.