There's been a major change in the way environmental governance works, which is most obvious in terms of climate policy. We initially expected climate policy to be set at the international level, followed by incorporation into national legislation, and implementation by agencies and lower levels of government like states. But this top-down governance scheme isn't the way things of worked out. Instead, we have climate policy being made by nations, states, agencies acting on their own, even to a small extent courts, with private firms also taking initiatives of their own. This is the first of four posts on successive Mondays about this bottom-up approach to governance.

We're still in the process of trying to conceptualize this development. Scholars talk about network or polycentric regulation. Both phrases capture part of the process. But that doesn't really get at the dynamics. The point is not just that jurisdiction are acting alone and sharing information. It's that they have a mutually reinforcing effect: the more entities take climate action, the more likely it is that others to act.

If a jurisdiction can increase the likelihood of climate action in other jurisdictions through its own climate actions, policy effectiveness can increase exponentially. This beneficial dynamic process can occur if emissions reductions change the economic and political balance in favor of reductions by others. Thus, emissions reductions could promote further mitigation if they increase the economic or political benefits of further reductions (by the same emitters or others) or decrease the economic or political costs of those reductions. There are several ways that this kind of beneficial feedback could take place.

**Economies of scale.** One driver is that expansion of renewable energy in some jurisdictions can contribute to economies of scale, reducing the cost of renewables and promoting their adoption in other jurisdictions. Partly, this just involves the standard process by which companies learn to do things better and cheaper as they gain experience; partly it reflects the cost advantages of dealing with higher volumes.

**Innovation incentives.** The larger the clean energy sector and the demand for clean energy grow, the bigger market there is for technological innovations. That provides a bigger incentive for R&D, and it also helps innovative firms get financing to survive the "valley of death" between invention and successful manufacturing and marketing.

**Political Feedback Loops.** The larger the clean energy sector gets, the more

money it has to devote to lobbying and political activity. And the more jobs it generates, the more voters there are who have

**Industry desire for uniformity.** Another driver of policy diffusion is industry's aversion to patchwork regulations. Lack of uniformity imposes significant costs on multinationals like Wal-Mart and producers of traded products. This can lead industry to support uniform regulation across jurisdictions, even if industry's ideal outcome would be to have no regulation at all. Sellers' desire for uniformity helped spark international action to protect the ozone layer. Lack of uniformity is also a problem for the international transportation industry. The European Union used this form of leverage to prompt international action on aviation emissions.

**Regulatory Learning.** Climate policy is complicated stuff. It took years for California to plan and launch its cap-and-trade system, and even then, the state needed to do some fine-turning once it was up and running. And it's not just a matter of controlling a few big sectors like electricity generators. That in itself is no small matter, since you basically need to rethink the entire grid, but there are also vehicles, methane emitters, and industrial sources to worry about. As jurisdictions like California and the EU learn how to address these issues, it becomes easier for other jurisdictions to do so.

There is certainly no guarantee that such dynamics will occur, but the possibility does provide support for independent action at the national or sub-national level, without waiting for an international mandate. It would be difficult to provide definitive proof about the relative strength of positive versus negative feedback effects in the adoption of local mitigation efforts and in international bargaining positions. To take one example, however, the failure of the US Congress to adopt climate regulation surely has not been helpful to international negotiations or encouraged more mitigation efforts in other countries.

My next post will discuss some side-benefits of bottom-up regulation, including the potential to learn from policy experiments and increased robustness to changes in the political winds.