We do not know how to decarbonize the grid.

The electric grid has been called the largest and most complicated of all human built machines. This unimaginably complex and sprawling construction is undergoing dramatic change. While all of us are looking forward to its decarbonization, I for one, am very concerned we don’t have a plan. The dirty little secret is; nobody has figured it out how to do it. So why all the hype about batteries, smart grids, microgrids, blockchain, and grid AI. Simple, companies want to sell you their proprietary technology as the cure all because they know nobody has a clue how to accomplish this vital decarbonization.

This really isn’t a problem of technology but of market structure, price indicators, market mechanisms and regulations; or lack thereof. Technology is easy once you know what you want to accomplish. Getting people, companies, states, and the Federal Government to agree and implement change is…well herding cats. A major part of the problem is using the wrong metaphor. Many people believe that the internet is the model for the future Grid. The grid is viewed as an information network whose value follows Metcalf’s Law (value of a network is the square of interconnecting nodes).

The problem is the grid is not an information network but an energy conserved network with feedback. The complexity of the grid when it had centralized generation was massive, but that pales in comparison to where we are heading. The distributed energy resource (DER) grid is very different from the internet. It is a network whose complexity grows as the N factorial of the number of interacting utilities and DERs. The complexity will grow at a much higher rate than expected and will dwarf the internet in a short period of time. All this means is our journey to the decarbonized grid will be more volatile, uncertain, frustrating, and risky. We are very likely to break things before we are finished. Companies need to take proactive steps to be resilient and protect their bottom line from the uncertainty of the grid as it transitions. Electricity in the United States is very inexpensive, until it isn’t there. Protect yourself. Exergy Energy is the concierge utility for organizations where energy is mission critical.