Major statutes aimed at governing technology and protecting public health tend to remain in place for decades, and even when amended the original framework often remains at the heart of the amended statute. The disparity between the pace of technological advancements, the time necessary to develop a scientific understanding of the impacts of those advancements, and the length of time between statutory updates raise the important question of how to ensure that the regulatory system can respond to new developments. Not only are major laws protecting public health rarely updated, scholarship on regulatory ossification suggests that in many instances regulators fail to adjust the regulatory approach once a structure is in place. The long-term effectiveness of a law intended to protect public health, therefore, may rest on its ability to both spur an administrative agency to take action and allow the agency to alter its application of the law over time. This process can allow a law to evolve, or "learn," over time by responding to new circumstances in a manner that most effectively achieves the statute's underlying goals.

A growing body of scholarship explores the concept of regulatory innovation as a strategy to adjust to new circumstances or improve regulatory responses to existing circumstances. Few articles, however define the term "regulatory innovation" or the specific factors that facilitate the innovation. Instead, the scholarship tends to include normative calls for innovation or *ex poste* characterizations of the innovation, relying on the overall context of the article to provide a meaning for the terms. This article will contribute to the literature by exploring factors that create the motivation to develop a new regulatory approach and the legal factors that allow the innovation to occur.

Innovation can occur by legislative design or by an agency seeking to apply an existing statute to a new problem. This article will focus on the latter context, applying the regulatory innovation lens to the challenge of achieving a statutory goal in the face of technological and scientific advances – situations that may have been anticipated at the time the law was adopted (e.g., the emergence of a new technology or a new understanding of the impacts of a technology), but for which specific information was not available at the time. The article will draw a distinction between requiring a regulator to take action (e.g., regulate a new pollutant) and inducing a regulator to implement an innovative regulatory approach (e.g., choosing a novel approach to achieve a statutory mandate), and suggests that incorporating measures intended to induce regulatory innovation can play an important role in ensuring that regulation keeps pace with technological advancements.

The article will develop a framework for understand how innovation occurs in the regulatory context, drawing upon economic concepts of induced innovation and the innovation possibility frontier. Drawing upon examples from the evolution of Clean Air Act regulation, the article will examine mechanisms for inducing regulatory action and defining the options available to the innovative regulator.