

# Occam's Razor and the Clean Air Act

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I wonder what would happen if we applied Occam's Razor to the Clean Air Act?

- “I hate that each sector has 17 to 20 rules that govern each piece of equipment and you’ve got to be a neuroscientist to figure it out”. –Gina McCarthy, U.S. EPA Administrator
- “The Clean Air Act is a model of redundancy. Virtually every type of pollutant is regulated by not one but several overlapping provisions.” – Ben Lieberman

**Occam's Razor** is that “**entities are not to be multiplied beyond necessity.**”

Occam—borrowing largely from Aristotle—posited the following:

1. It is futile to do with more what can be done with fewer. [*Frustra fit per plura quod potest fieri per pauciora.*]

2. When a proposition comes out true for things, if two things suffice for its truth, it is superfluous to assume a third. [*Quando propositio verificatur pro rebus, si duae res sufficiunt ad eius veritatem, superfluum est ponere tertiam.*]
3. Plurality should not be assumed without necessity. [*Pluralitas non est ponenda sine necessitate.*]
4. No plurality should be assumed unless it can be proved (a) by reason, or (b) by experience, or (c) by some infallible authority. [*Nulla pluralitas est ponenda nisi per rationem vel experientiam vel auctoritatem illius, qui non potest falli nec errare, potest convinci.*]

► **In physics:** Occam's Razor (or parsimony) was used to formulate the theory of special relativity by Einstein, the principle of least action by Mauepertuis and Euler, and quantum mechanics by Planck, Heisenberg, and Broglie.

► **In chemistry:** Occam's razor was used to develop the theories of thermodynamics and the reaction mechanism.

► **In statistics and probability theory:** Occam's razor is part and parcel of the idea that if an assumption does not improve the accuracy of a theory, its only effect is to increase the probability that the overall theory is wrong. Several theories and explanations in this field have derived or expanded on Occam's razor including; Kolmogorov complexity, Bayesian model comparison, Akaike Information Criterion, Laplace approximation, and the Kolmogorov-Chaitin Minimum description length approach.

► **In biology:** Occam's razor was used in the development of evolutionary biology and systematics.

► **In religion:** Occam's Razor was used by Thomas Aquinas to help explain the existence of God. Aquinas was noted for saying, "If a thing can be done adequately by means of one, it is superfluous to do it by means of several; for we observe that nature does not employ two instruments [if] one suffices."

**How about applying Occam's Razor to the Clean Air Act and see what we can discover???** Here are some thoughts on what this might look like (see [link](https://docs.google.com/a/jedlaw.net/file/d/oB8c4LpGCMICsZWZlZFljRnpyNFE/edit) and [link](https://docs.google.com/a/jedlaw.net/file/d/oB8c4LpGCMICsZWZlZFljRnpyNFE/edit) (<https://docs.google.com/a/jedlaw.net/file/d/oB8c4LpGCMICsZWZlZFljRnpyNFE/edit>) and [link](http://www.breakingthelogjam.org/CMS/files/ClimateReportv1r4.pdf) (<http://www.breakingthelogjam.org/CMS/files/ClimateReportv1r4.pdf>)). .

**What do you think it would look like?**

The world is changing. We must change with it. Time to transform the SIP process. We can make it happen.

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