

Emergy, Transformity, the Emergy Unit and the Emergy Baseline

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This paper addresses three important research areas subject to some disagreement within the community of emergy practitioners or to misunderstandings within the scientific community as a whole. Emergy and its sister idea, transformity, are important new concepts derived from the proposed laws of non-equilibrium thermodynamics developed by H.T. Odum. While the formal definition of emergy is well known, there is still some debate about the meaning of this new idea and those not trained in Emergy Systems Theory may experience considerable difficulty in understanding its meaning. In this paper we consider the concepts of emergy and to a lesser degree transformity with the purpose of gaining a better understanding of their meaning. In addition, the origin of the word “emergy” is reexamined and an etymological argument is used in a re-derivation of the term. Furthermore, scientists performing emergy research have used different names and abbreviations for the emergy unit. Use of the various names for the emergy unit are reviewed and appropriate and inappropriate abbreviations are considered based on the rules and style conventions of the International System of Units (SI) and the standard rules governing use of the English language. Finally, we examine the planetary baselines currently in use and present criteria for determining their plausibility. Based on these criteria, we present a recalculation of the planetary emergy base line and explain why this recalculation produces a result that is superior to existing choices.

Keywords: emergy; transformity; the emergy unit; emjoules; planetary emergy baseline