

# Review of: "Unified Classical Thermodynamics: Primacy of Dissymmetry Over Free Energy"

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**Potential competing interests:** No potential competing interests to declare.

I value the historical perspective presented in the paper. I found the paper very interesting and touching an essential point. The paper's main goal is to unify two branches of thermodynamics. However, I feel it needs to be clarified what exactly is unified. Can the unification be expressed in mathematical terms? For example, can we introduce a set of statements from which the two branches follow?

Although laborious, it could be profitable to define the notions appearing in the paper on the level of irreversible thermodynamics (equivalently, thermo-hydrodynamics), which should describe all discussed examples in detail. In particular, heat and volumetric work can be derived from the energy balance equation integrated over a proper volume. All the processes from the examples (including combustion) can be described by thermo-hydrodynamic equations with time-dependent parameters that control the boundary conditions. The thermo-hydrodynamic perspective would clarify the subtleties related to energy and entropy and remove the conceptual problem of combining them (see lines 819-825, v2).