

The Law of Reliable Resource Supply: Making Altshuller's Laws of System Evolution Sustainable¹

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Abstract. This paper explores the integration of sustainability aspects into Altshuller's Theory of Solving Inventive Problems (TRIZ), a central component of which is the collection of laws concerning the evolution of technical systems. Building on Altshuller's eight laws generated through the principle of idealization, we argue that these laws, with their inherent focus on system efficiency, overlook the necessity of reliable resource supply. We note the paradox where a system developed per these laws could potentially cease to exist prematurely due to resource depletion, despite compliance with all efficiency-oriented guidelines. This paradox emphasizes that sustainability extends beyond mere efficiency, an insight underpinning Müller-Christ's approach to sustainability management, which treats efficiency and sustainability as contradictory management rationalities. We argue that achieving sustainability necessitates extending the time horizon for cost-benefit analysis, beyond immediate cost reduction. We propose a framework for incorporating sustainability into Altshuller's laws by delineating three resource types based on their consumption modes, establishing resource availability as a crucial feature of artificial instrumental systems, and applying the principle of idealization to derive the law of reliable resource supply. Additionally, we suggest design principles for managing these three resource types, promoting more sustainable system development.

Keywords: Laws of Technical System Evolution, Energy, Resources, Sustainability, TRIZ.