

Economics as a Tool for Technology Development: Making Cost an Engineering Variable

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ABSTRACT

The commercialization of new technology faces a unique challenge in the automotive industry. Existing processes have been highly optimized for cost and productivity and are supported by a multi-billion dollar engineering and capital infrastructure. A competing innovation must be extremely financially compelling to justify any change to this infrastructure, but the R&D process rarely explicitly addresses this requirement. Early refinement of new technologies, where most of the key characteristics are defined, usually places the emphasis on technical performance, leaving the economics to a separate commercialization process. A more effective approach is to bring the issue of cost into early stage development, making it a responsibility of the scientist and engineer. Techno-economic analysis adds another dimension to engineering optimization, and provides an effective tool to guide the decision-making process, resulting in lower risk, higher yield research.