

A Systematic Approach for Energy Technology Assessment

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A systematic computer-based technology assessment (TA) tool involving a combination of systems analysis tools of material flow analysis (MFA), life cycle assessment (LCA) and life cycle costing (LCC) has been under development at the Division of Industrial Ecology, Royal Institute of Technology in Stockholm. Its focus, to start with, is the assessment of the ecological and economic impacts of material- and energy-intensive energy technologies. The tool has shown merits of locating weak links along a chain of technologies. The modular structure of the tool enables scenario construction, which, in principle, makes a comparative assessment of indefinite number of chains of technologies possible.

Two TA studies are used for illustration purpose. The first one has a focus on link between waste management and the transport system via fuel (biogas and hydrogen) production from waste and the second one on thermal technologies of energy production with gasification followed by catalytic combustion at the core.

Keywords: technology assessment (TA), material flow analysis (MFA), substance flow analysis (SFA), life cycle assessment (LCA), life cycle costing (LCC), technology, systems analysis, sustainable development.

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