

A Sustainable, Parallel & Electrical Economy

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ABSTRACT

A sustainable economy, based partly on the utilization of the waste stream & the monetization of energy, is proposed. This self-sufficient economy would be carbon neutral, & use sunlight, wind and waste-derived syngas as its principal energy sources. The ecological model given here would have implications for lunar bases, prisons & refugee camps & would involve the use of an electric currency (kWh) as the medium of exchange.

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Introduction

The building of a sustainable economy is commonly ascribed to 3 complementary domains that must be in balance for sustainability to occur. These are environmental, social & economical. Comet 2025 disagreed with this model and proposed that all waste, in an ecology-based economy, is used as fuel, food for animals, recycling and composting etc. If waste was used as the primary source of raw materials, then automatically the 3 domains of sustainability would fall into harmonious balance [1].

Ecological Model

The forest floor is a good example of a working ecological system [2]. Here dead leaves, wood & various animals are quickly decomposed by a range of detritivores that extract energy & nutrients from dead tissue. Fungi, bacteria, beetles and vultures spring to mind. The ecosphere, a closed aquarium, shows similar relationships, when exposed to sunlight. Decomposition may be arrested in anoxic environments. There is, so far, no recognized model for a similar arrangement in human economies, though waste to energy systems are sometimes used. Most waste, particularly plastics, are simply landfilled.

Types of Waste

Types of waste have been summarized by Comet, 2025, & in virtually every case an industry can be found somewhere that profitably makes use of each waste type. Recycled metals seem to be particularly profitable, but even rock waste & demolition debris can have value. It could be argued that the reason for the accumulation of wastes in human society is because naturally sourced materials are found in nature that are highly concentrated & hence more profitable. An example might be super-phosphate fertilizer derived from phosphate rock will probably be more profitable, by reasons of scale, than phosphate recovery & fertilizer manufactured from waste-water plants (as well as bones from food waste). The waste-derived fertilizer will probably not be competitive with fertilizer derived from a natural source, which will be cheaper by virtue of its greater concentration of phosphate in commercially obtained, & mined, phosphate rock.

However, this argument can sometimes be refuted by reference to metals, particularly aluminum. Aluminum from recycled cans will be cheaper than bauxite-derived aluminum. This is because melting the collected cans will use far less electrical energy than refining bauxite.

Electrical Currency

A sustainable banking system, based on the Kilowatt hour, (kWh) can be created by using a microgrid array arranged in “island mode” [3]. The kWh tariffs in Texas between 8 & 18 cents & could be used to form a local currency. If the microgrid is constructed in “island mode” a self-sufficient community can be created. Periods when there is no sunshine or wind can be negotiated with the aid of batteries or by using waste as fuel. Alternatively, a connection to the main regional grid can be used to supplement the microgrid at times of low power. Conversely, at times when too much power is generated by the microgrid, then this excess power can be uploaded to the main grid in return for credits. The excess power could also be used to gasify waste & the gas used as an energy store. If successful, a microgrid array could be used as the basis of a parallel economy. In desert environments, where there is surplus of energy, desalinated water may provide the basis for a water-based currency [4].

Using Waste Versus Virgin Raw Materials

In general economics favors the use of virgin raw materials, though there are exceptions as noted above. To live sustainably waste has to be used preferentially [5]. This might involve modifying the economics of recycling & reuse. The municipality might issue carbon credits for producing waste-derived energy or materials. Alternatively, a “nuisance tax” could be paid to manufacturers that take specific resources from the waste stream & transform them into something useful. Syngas from waste, for example, can be converted into various plastic monomers, petroleum substitute or used to drive a gas turbine. Hence an oil refinery that accepted mixed plastic waste would be paid by the municipality to avoid the cost of landfilling waste plastic. Possibly the state would

issue carbon offsets to the oil refinery for using plastic waste. Private/public collaborations would be essential to raise capital for financing.

Conclusions

To understand how a sustainable economy might work on a lunar base may involve setting up closed economic systems on earth. An off grid, self-sufficient, prison farm that issues its own currency, based on kWh, might be a place to monitor the flow of money in a closed system. Similarly, a Kibbutz or a Mennonite community. The economic rules, inductively derived, might be applied to a refugee camp. Success in running a lunar base may be contingent on assisting a refugee camp! Running a refugee camp, may in turn, also give insight in developing a parallel economy within a major city, & rural hinterland, in which employment is linked to use of waste.

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