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The problem deals with the production of perishable goods. A set of plants can produce such goods but they are heavily constrained. Each plant can either produce nothing (being offline) or between some minimal and maximal level. Whenever a plant goes online this incurs some set up cost. Finally each produced good incurs some proportional cost. Production levels of each plant can also be constrained by other constraints, such as variation constraints (the production level may not vary more than this amount, in this amount of time). Customer consume these goods, but with some highly varying levels. Moreover goods cannot be stored (between two time steps they perish) and production should be strictly equal to consumption.

Intuitively, there are situations in which the producer could be willing to pay consumers to consume more goods as this turns out to be globally cheaper (for instance if that avoids stopping a plant). For such time periods, the goods would have a negative price. Now the question is : Can necessary and sufficient conditions for negative prices be given ?

More globally, given a feasible production planning, can conditions be given on what would be called a consistent price system (with that planning) ? In this respect, consistent would be defined roughly as a system in which the consumer does not pay more than required (no competitor could offer the goods cheaper) and the producer is sufficiently paid (does not go bankrupt) ? One such intuitive condition would be that prices are sufficiently high for the start up costs to earned back (most of the time?).