We develop a decision-making tool based on a bilevel complementarity model for a merchant price-maker energy storage system to determine the most beneficial trading actions in pool-based markets, including day-ahead (as joint energy and reserve markets) and balancing settlements. The uncertainty of net load deviation in real-time is incorporated into the model using a set of scenarios generated from the available forecast in the day-ahead. The objective of this energy storage system is to maximize its expected profit. The day-ahead products of energy storage system include energy as well as reserve commitment (as one of the ancillary services), whereas its balancing product is the energy deployed from the committed reserve. The proposed model captures the interactions of different markets and their impacts on the functioning of the storage system. It also provides an insight for storage system into clearing process of multiple markets and enables such a facility to possibly affect the outcomes of those markets to its own benefit through strategic price and quantity offers. The validity of the proposed approach is evaluated using a numerical study.