

Higher variable renewable generation penetrations are occurring throughout the world on different power systems. These resources increase the variability and uncertainty on the system which must be accommodated by an increase in the flexibility of the system resources in order to maintain reliability. Many scheduling strategies have been discussed and introduced to ensure that this flexibility is available at multiple timescales. To meet variability, that is, the expected changes in system conditions, two recent strategies have been introduced: time-coupled multi-period market clearing models and the incorporation of ramp capability constraints. To appropriately evaluate these methods, it is important to assess both efficiency and reliability. But it is also important to assess the incentive structure to ensure that resources asked to perform in different ways have the proper incentives to follow these directions, which is a step often ignored in simulation studies. We find that there are advantages and disadvantages to both approaches. We also find that look-ahead horizon length in multi-period market models can impact incentives. This paper proposes scheduling and pricing methods that ensure expected ramps are met reliably, efficiently, and with associated prices based on true marginal costs that incentivize resources to do as directed by the market. Case studies show improvements of the new method.