Many demand side resources have the potential to provide fast and low cost balancing services. Switching these devices on and off can be executed in seconds and have limited consequences for the customers if the duration is not long. With carefully designed market rules, tens of thousands of such loads can deliver a well-behaved, stable and predictable balancing support. Based on a comprehensive analysis of the current balancing markets, as well as the technical properties of traditional and potential balancing resources, this paper proposes a new real-time balancing market setup facilitating the participation of demand-side resources. In light of the future environment of increasing intermittent renewable power and distributed energy/storage resources, stochastic time-series and Monte-Carlo simulation are used to analyze the relationship between balancing requirement and generation/demand uncertainties. This research is potentially useful for designing future balancing markets and utilizing demand response for system services. Copyright (C) 2011 Praise Worthy Prize S.r.l. - All rights reserved.