A new load-reducing control strategy for individual blade control of large pitch-controlled wind turbines is presented. This control concept is based on local blade inflow measurements and offers the possibility of larger load reductions, without loss of power production, than seen in other state-of-the-art load-reducing concepts. Since the new flow-based concept deviates significantly from previous published load-reducing strategies, a comparison of the performance based on aeroelastic simulations is included. Advantages and drawbacks of the systems are discussed.