Icing on the blades of a wind turbine can lead to significant production losses during the winter months for wind parks in cold climate regions. However, there is no standard way of identifying ice-induced power loss. This paper describes three methods for creating power threshold curves that can be used to separate iced production periods from non-iced production periods. The first approach relies on a percentage deviation from the manufacturer's power curve. The other two approaches fit threshold curves based on the observed variance of non-iced production data. These approaches are applied to turbines in four wind parks and compared with each other and to observations of icing on the nacelle of one of the turbines in each park. It is found that setting an ice threshold curve using 0.1 quantile of the observed power data during normal operation with a 2-h minimum duration is the best approach for icing identification. The quantile should be fit based on at least 1 year of data, and a smoothing function should be applied to the quantile results to remove any outliers caused by limited numbers of data points.