

## Restricted power domination

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Power domination in graphs was motivated by the problem of monitoring an electric power grid by placing the fewest monitoring devices in the system as possible. The power dominating set of a graph is a set of vertices that observes every vertex in the graph, following a set of rules that model the physical rules for monitoring a power network. We introduce *restricted power domination* to study the problem of minimizing the number of additional monitoring devices necessary to observe the network after adding on to an existing network, which has existing monitoring devices already in place to observe the old electric power grid. The *restricted power domination number* of a graph  $G$  subject to a set of vertices  $X$  is the size of the smallest power domination set of  $G$  that contains  $X$ .

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