

Example of resource selection process:

To illustrate how the automated resource selection works, a simple example is found in Table 1. In this case, the Capacity Constraint increases by 11.63 MW. The objective is to add capacity to meet the constraint while minimizing the “Total Value Function”. In this example, there are three actions that are possible, “Do Nothing”, “Build ICE”, or “Build Frame CT”. The first possible action, “Do Nothing”, does not pass the Capacity Constraint, so it is eliminated in the backwards pass. The other two potential actions, “Build ICE” and “Build Frame CT”, both pass the Capacity Constraint evaluations in the backwards pass for this time step, and so these possible actions are used in the forward pass selection process. After the forward pass is completed, “Build” in t=114, which refers to the 114 month is selected in the forward pass.

Table 1. Example of resource selection process at time step t=114

	Next Action to take	t	Added Capacity (MW)	Change in Capacity Constraint (MW)	Capacity Constraint Pass	Total Value Function	Selected
As selected	Do Nothing	114		11.63	N		N
As selected	Build ICE	114	18.4	11.63	Y	4,546M	Y
As selected	Build Frame CT	114	79	11.63	Y	4,583M	N

Because PowerSimm simulates future weather, renewables, load and price conditions, the automated resource selection process is carried out across each of the simulated future states. After selection of the best plan for each future state, the selection process then determines the best resource option over all future conditions. While the final selected expansion plan may not be “the best” for any one future state, it is the “best plan” over all future states. By considering a broad set of future simulated conditions, PowerSimm yields a more robust resource plan that incorporates a broad set of future outcomes without any loss of significant physical operations in hourly dispatch.