

Next Level of Efficiency

Now that most snowmaking systems are upgraded with the resources of low-e snow guns, automation, VFD's and better compressors; managers are in search of the next level of efficiency. Reality is that all of this equipment, including automation, needs human resources to operate it at best production. Thus, the next level comes from maximizing performance of the human resources.

To insure maximum performance requires a standard or benchmark to measure against. Once the benchmark is established, actual operations are compared to it and the differentials are reported as productivity margins. These KPI's measure how efficient equipment is operated and how effective labor (and automation) reacts to temperatures and production opportunities.

For snowmaking, common KPI's are Cost/Acre-Ft of Snow and kWh/KGal. In the report below we see how benchmark analytics use margins to quantify the differential of actual and potential productivity.

Snowmaking KPI's and Efficiency Margins

12/08/12 Time	WB Temp F°	Cost/Acre-Ft			Energy kWh/KGal			kWh (+/-)	CO ₂ Lbs (+/-)
		Actual	Benchmark	Margin	Actual	Benchmark	Margin		
2:00	11.1	\$639	\$554	13%	34.7	33.6	3%	238	380
4:00	8.4	\$611	\$552	10%	34.2	32.5	5%	431	689
6:00	13.1	\$601	\$579	4%	33.7	35.3	-5%	-412	-659
8:00	11.4	\$562	\$554	2%	31.0	33.6	-8%	-649	-1,039
10:00	15.2	\$672	\$612	9%	36.9	37.2	-1%	-70	-112
Noon	17.2	\$835	\$665	20%	44.7	40.2	10%	693	1,109
14:00	18.7	\$944	\$700	26%	51.4	41.7	19%	1,390	2,223
16:00	18.5	\$918	\$700	24%	49.9	41.7	16%	1,204	1,926
18:00	13.5	\$907	\$579	36%	49.3	35.3	28%	2,096	3,354
20:00	10.5	\$907	\$548	40%	49.6	33.2	33%	2,498	3,997
22:00	8.8	\$625	\$552	12%	34.0	32.5	4%	333	532
24:00	5.1	\$643	\$591	8%	34.9	32.9	6%	431	690
		\$739	\$599	17%	40.4	35.8	9%	8,182	13,092

How do benchmark analytics take you to the next level of efficiency?

KPI's measure *actions* of the entire process, so managers know the value of all practices, including best and worst practices. This awareness empowers decision-making and adjustments that:

- Optimize the technology of low-e snow guns and automation.
- Close the gap that exists between actual and potential snow production.
- Reduce energy waste by knowing when it occurs.
- Use statistical management methods that account for the effects of temperature, instead of habits.
- Accelerate the pace of energy savings - by expanding frequency and longevity of best practices.

Your business immediately benefits as the manufacturing process (measurably) makes the most snow for the least expense. From adjustments such as snow gun selection, compressor bypass, pump sequencing, transportation, and field communications; costs are reduced by 4%-20%. Depending on the size of the system, annual expenses decrease by \$20,000-\$100,000.

Starting Point

Just like the benchmarks used in other departments, raw data needs to be collected, computed and reported. This is accomplished with manual logs and spreadsheets or automatically with software. Please contact us for more performance reports that help you elevate snowmaking to the next level of efficiency.