Power Management

- An Overlooked Opportunity for the Car Wash Industry

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Electricity Costs

- One of the largest input costs for our industry
- Electricity Rates have experienced double digit increases in recent years
- Significant future rate increases are projected

Factors Affecting Electricity Costs

- Kilowatt Hours Used - Time of Use
- Peak Kilowatt Demand - Maximum Demand
- Summer vs Winter Billing Rates
- Peak, Shoulder and Off-Peak Rate Schedules
- Hours of Billed Demand
- Rate Plan
- Fuel Surcharges

Kilowatt Usage

- Relationship of KW to HP is 0.7457
- A 25 HP motor requires 18.64 KW/hour (25x0.7457 = 18.64)
- Using a typical kilowatt charge of $0.10, it costs $1.86 per hour to run a 25HP motor
- Based on a 10-hour day, this translates to $6,789 per year

Peak KW Demand

- Defined as maximum KW demand for the billing period
- Usually measured in 15 minute increments
- Sets the baseline for most rate plans
- As expected, typically coincides with the busiest time increment of the car wash

Peak KW Demand - Example

- Suppose monthly wash volume of 8,000 cars
- Daily wash volume ranges from 50 cars to 500 cars
- Maximum hourly volume is 70 cars
- Suppose Peak KW set during 70 car hour is 180 kilowatts, all other hours are significantly less
- Rate plan is based on delivering 200 hours of peak demand (180 KW x 200 hours) = 36,000 kilowatts
- Most expensive kilowatt rate will be the first 36,000 kilowatts, excess kilowatts billed at a lower rate
- **IMPORTANT: Lowering Peak KW demand lowers the threshold where cheaper kilowatt rates apply**

Summer Vs Winter Rates

- Electricity usage is highest in the Summer (June - September) due to use of air conditioning
- Winter demand (October - May) is substantially less
- Summer usage typically pegs the billing rate on a 12-month rolling cycle
- Summer rate is typically the higher of 1) actual usage for current month or 2) 95% of highest summer use in any previous month
- Winter rate is typically the higher of 1) 95% of summer usage or 2) 60% of actual usage for the current month

IMPORTANT: The electric utility doesn't care how much electricity is used in the Winter compared to the Summer usage!

Peak, Shoulder and Off-Peak Hours

- Definitions vary between utilities and within rate planes
- Typically, Peak is defined as Summer, Monday - Friday, 2pm-7pm. Peak hours carry the highest kilowatt rates.
- Shoulder may be defined as Summer, Monday-Friday, 12pm-2pm and 7pm-9pm. Shoulder rates are lower than peak rates.
- Off-Peak is defined as all other operating hours. Kilowatt rates may be a fraction of Peak rates.

IMPORTANT: Weekends are defined as Off-Peak. Most Winter hours are defined as Off-Peak.

Hours of Billed Demand

- Maximum monthly hours (24/7 operation) is 720 hours
- Most plans have 3 tranches of billed hours (200,400,600)
- First 200 hours are the most expensive. Rates for additional operating hours are much lower
- Typical car wash operates 300-360 hours per month
- Unless extremely busy, most washes will not exceed Peak KW demand for first 200 hours (see Peak KW Example)

Rate Plans

- There may be more than one depending on the provider.
- Provider may not have placed the business on the optimum plan at time of start-up.
- Plans can vary greatly. The provider should be able to compare plans based on actual usage.
- Two primary categories are demand based (Peak KW) and time of use.
- Careful analysis should be done before switching rate plans.

Fuel Surcharges

- Significant factor in electricity costs
- Have risen significantly as oil / gas prices skyrocketed
- Have not fallen with corresponding decline in oil / gas prices
- Are based on total kilowatt hours
- Can exceed $0.05 per kilowatt hour in some cases

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Electricity Costs in Car Wash Industry

- Typically, the majority of electric horsepower in a car wash is involved in the movement of air (blowers and vacuums).
- In some cases can represent as much as 75% of total horsepower.
- Most inefficient use of power (blowers operating without a car or vacuums operating with less than full demand).
- The relationship between input power and motor speed is a cubic function for centrifugal applications.
- What does this mean?

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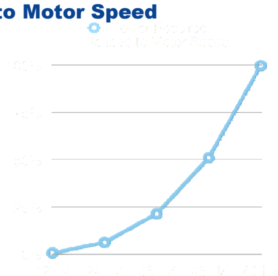
Relationship of Power to Motor Speed

- The power required to turn a fan motor is the cube of the motor's speed
- Running a motor at 80% of capacity requires only 50% of the power, at 50% capacity, the power requirement is 12.5%!



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Variable Frequency Drives (VFDs)

- Variable Frequency Drives control the rotational speed of an alternating current electric motor by controlling the frequency of the electrical power supplied to the motor.
- By controlling the speed of the motor, electricity costs can be greatly reduced in applications involving centrifugal fans such as blowers and vacuums
- VFDs allow operators to go from “full demand” to “on-demand” to eliminate wasted energy use.
- There are tremendous inefficiencies in the operating of blowers and vacuums based on constantly changing levels of business throughout the day

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Blower VFDs

- Allows blowers to stay on for extended periods of time by idling at a low speed saving wear and tear on the motor.
- Can be programmed to ramp down between cars eliminating the typical “look back” setting.
- Different blower configurations can be configured based on wash packages.
- Temperature settings can be programmed to determine the necessary horsepower for drying.
- Maximum speed can be programmed to less than 100% to match the efficiency of certain blower parameters.
- Electricity savings occur continually throughout the day based on demand.

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Vacuum VFD's

- Allows vacuum motors to run at minimum speed necessary to produce required suction.
- As demand increases (i.e. users), motor speed increases to provide more pressure.
- As vacuums are used or nozzles hung, motor speed reduces to maintain constant pressure.
- Continuous feedback allows motor speed to produce just enough pressure regardless of users.
- Delivers considerable savings since most vacuum motors run throughout the day.

Vacuum VFDs - A Real Example

(25 HP Vacuum Motor @ $0.10 / KWH)

Nozzles Off	Hertz	Power	KW	Cost/Hr	Annual Cost	Savings
0	41	32%	5.95	$0.60	$2,592	68%
1	43	37%	6.86	$0.69	$2,981	63%
2	47	48%	8.96	$0.90	$3,888	52%
3	50	58%	10.79	$1.08	$4,666	42%
4	54	73%	13.60	$1.36	$5,875	27%
5	58	90%	16.85	$1.68	$7,258	10%
6	60	100%	18.65	$1.87	$8,078	0%

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Case Study #1 - Install VFDs

- Express Exterior Car Wash with 355 total motor HP
- 6 x 25-HP Vacuum Producers
- 8 x 15-HP Blower Producers
- Installed 4 x 25-HP VFDs on Vacuum Producers 08/08
- Annual wash volume of approximately 120,000 cars

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Case Study #2 - VFD Upgrade

- Exterior Express Wash with 430 total motor HP
- 12 x 15-HP Blower Motors
- 2 x 30-HP and 2 x 25-HP Vacuum Motors
- Installed VFDs on vacuums upon installation, upgraded to “continuous” VFD programming from “step” programming in July 2008
- Reduced Blower HP in warmer months from 180 HP to 105 HP
- Annual wash volume of approximately 140,000 cars

Case Study #3 - Get a New Plan, Stan

- Express Exterior Car Wash with 415 total motor HP
- 8 x 15 HP Blower motors
- 6 x 25 HP Vacuum motors
- Switched from Demand Pricing plan to Time of Use - Retail plan in October 2008
- Goal is to get new baseline cost before investing in VFDs for blowers and vacuums
- Annual wash volume is approximately 100,000 cars

Case Study Conclusions

- Case Study # 1 - After Installing 4 VFDs, the average daily electrical cost has declined approximately 14%. Keep in mind that rates have increased nearly 30% over last two years.
- Case Study # 2 - Because VFDs were installed from the start, electricity costs per day lowest of the three locations despite being the highest volume wash with more HP.
- Case Study # 2 - Upgrading VFDs and managing Blower HP during the summer created additional savings of more than 20%.
- Case Study # 3 - Finding a more attractive rate plan has lowered average monthly electricity costs by 28%. Further savings can be had by installing VFD technology.
- Combined, the three locations have seen a decline of $92 per day in average electricity costs. This annualizes to $33,000 in permanent savings.

Summary

- Managing Electricity Costs is one of the most significant opportunities facing the car wash industry
- Installing VFD technology lowers both peak demand and total kilowatts. This leads to permanent savings especially as rates continue to rise.
- There are other methods that can be used for power management including reducing HP during the summer months and also selecting the right rate plan.
- The increased cash flow to the operator can result in a significant increase in the value of the wash as every marginal dollar of savings falls to the bottom line. Using the case study example, $33,000 of increased EBITDA at a 5x multiple creates $165,000 of increased enterprise value.