ABC Manufacturing Limited

Plant Name

Anytown, Nova Scotia

Feasibility Study (Example)

for

Dust Collector Cell #5 Fan Upgrade

Date

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Feasibility Study Report (Example)

1. Project Information

ABC Manufacturing operates a hardwood furniture manufacturing facility in Anytown, Nova Scotia. ABC plans to upgrade an exhaust fan for the plant wood dust collection system, to meet increased production levels. This study evaluated two fan models, one of which is more efficient and also more expensive.

2. Measure Description

2.1. Existing Conditions

The plant has a dust collection system consisting of ten exhaust fans and two dust collectors with total airflows in excess of 100,000 l/s and connected load of approximately 500 kW. Wood dust is collected from the various manufacturing processes within the plant and conveyed to the dust collectors where it is transferred to the cyclone and eventually into silo storage for disposal. A single line process schematic is shown as Figure 1, in Appendix B.

ABC Manufacturing is planning to replace an existing exhaust fan that serves work cell #5 and discharges to dust collector #1. The existing fan, delivering 4,000 l/s and equipped with a 30 kW (40 HP) motor, is roughly 20 years old. The constant volume fan operates at steady load for 6,000 hours per year.

2.2. Recommendation

The recommended fan must have a capacity of 7,000 l/s and will require a 75 kW (100 HP) motor operating under steady load for 6,000 hours per year, scheduled by the existing control system. Based on the age of the fans currently in use, the new fan will have an estimated life of at least 20 years.

This study evaluated the purchase of two different fans: one with an efficiency of 72% and the other with an efficiency of 62%. The more efficient fan is recommended, however, based on first year energy savings, ABC's required simple payback of two years will not be met. An incentive from Efficiency Nova Scotia will reduce the simple payback to two years.

2.3. Savings and Cost Estimates

- Electricity cost savings: $4,414 per year
- Other Benefits: $400 per year
- Incremental Cost: $15,500

Power requirements for both fan options were determined from the manufacturers' performance curves in Appendix B. At the operating points indicated on the curves, the difference in fan input power is 10 kW. Operating 6,000 hours per year under constant load, the more efficient fan will save 60,000 kWh per year. All calculations are detailed in Appendix B.

The new fan has been selected to provide additional exhaust capacity to support increased production requirements. Selecting a new fan that will operate very close to its optimum efficiency point on its operating curve will increase reliability and therefore reduce maintenance costs. An allowance of $400 per year, based on ten hours of labour at $40 per hour, has been made for reduced maintenance costs.

Installed cost estimates are summarized in Figure 1. Costs are based on the vendor, consultant and contractor quotations provided in Appendix B. The added engineering and installation costs are for ductwork modifications needed to accommodate the more efficient fan.

Figure 1: Cost Summary

	Base Case ($)	Energy Efficient Case ($)	Incremental Project Cost ($)
Equipment	24,000	37,000	13,000
Installation	3,000	5,000	2,000
Engineering	500	1000	500
Total Costs	**27,500**	**43,000**	**15,500**

3. Measurement and Verification (M&V) Plan

Performance of the new fan will be verified by fan power measurements (amperage readings) taken by the balancing contractor during commissioning under normal load conditions. The annual energy use of the new fan will be calculated using these measurements and the confirmed operating schedule.

ABC will provide Efficiency Nova Scotia with an M&V Report that includes a copy of the Testing, Adjusting and Balancing (TAB) report for this installation. The TAB report will identify the test equipment, measurement points and dates. The M&V Report will also include a brief analysis to confirm actual savings based on the fan power measurements.

The cost for these measurements is included in the installation costs quoted above. The costs for M&V analysis and reporting are included in the engineering costs quoted above. No equipment will be required from Efficiency Nova Scotia to complete these measurements.

4. Implementation Schedule

Installation is scheduled to start on August 1, 2015 with completion by August 3. The M&V Report will be submitted by August 31, 2015 .

5. Financing

No financing is being requested for this project.

6. Appendix A: Feasibility Study Data Sheet

(Please insert a hard copy of the Feasibility Study Data Sheet after this page of the printed report.)

7. Appendix B

Table of Contents

1. Single line process schematic
2. Fan performance curves and performance data sheets
3. Savings and cost calculations (hard copy and MS Excel file on CD)
4. Cost quotations

(The actual documents for Appendix B are not included in this example.)

END OF FEASIBILITY STUDY REPORT