

Recommendation

Sell fiberglass mat waste to a glass recycler or fiberglass manufacturer instead of paying to send it to a landfill. This will reduce waste disposal costs and possibly bring in extra revenue, reducing associated annual waste disposal costs by 51%.

Annual Savings Summary

<i>Source</i>	<i>Quantity</i>	<i>Units</i>	<i>Cost Savings</i>
Solid Waste (non-haz)	136,000	Pounds	\$125,425
Administrative Costs	0	no units	-\$61,077
Total	0	MMBtu	\$64,349

Implementation Cost Summary

<i>Description</i>	<i>Cost</i>	<i>Payback (yrs)</i>
Implementation Cost	\$61,077	0.9

Facility Background

The facility currently has three types of waste that require disposal: fiberglass mat, sand, and granules. After the site visit, facility personnel provided analysts with data of the total waste disposal costs from 2013 to 2014. This data was used to determine the average mass of fiberglass waste produced per month and the cost of fiberglass waste disposal per ton.

Fiberglass mat is the base structure for the roofing shingles, and of any mat that comes off the role in bad condition must be disposed of. Additionally, ¼ inch of mat left on the cardboard core at the end of the role is discarded. The facility currently sends all fiberglass mat waste to a land fill. The facility worked with a corporate waste broker to create its current waste management system.

The sand and granule waste mostly comes from floor sweepings as the bins used to store and transport the sand and granule raw materials are not sealed well. There are also places within the process where sand and granules are shaken off the product. This waste is sold to an asphalt recycling company. The amount of sand and granule waste in 2014 was found to be a fraction of the amount of waste in 2013. It appears this waste material generation has been greatly reduced, and analysts do not consider it to offer a significant cost saving opportunity.

There is an opportunity for waste disposal cost savings and possible introduction of revenue if the facility sells the waste fiberglass mat as raw material to a glass recycler or fiberglass manufacturer.

Technology Background

Fiberglass mat is produced through a process called pultrusion in which fibers are woven together. The glass fibers are produced by gradually melting silica and other minerals together and then forcing the molten mixture through extremely small diameter orifices to create individual filaments that are bundled together. Since fiberglass is made to have uniform composition in the filaments, it is possible to melt it back down and extrude it through the orifices again to re-form filaments and create a new fiberglass mat.

Proposal

Sell fiberglass mat waste to another industrial facility such as a glass recycler or fiberglass manufacturer to use instead of paying to send it to the landfill. This will reduce waste disposal, reducing annual waste disposal costs by \$64,349.

Notes

Analysts recommend posting an advertisement on an industrial materials exchange in order to find a facility willing to take or buy the fiberglass mat. Some good resources for doing this can be found at:

- <http://www.materialsinnovationexchange.com/materials-exchange/>
- http://www.nwmaterialsmart.org/find_exchange.html
- <http://pprc.org/index.php/2012/projects-2/projects/resourcefull-use>

There may be possible quality concerns with scrap collected from further down the process that may be contaminated with residual asphalt or granuels. However, analysts were unable to obtain information regarding this and it is not accounted for in the economic results.

The following analysis assumes the facility enters into an agreement whereby they pay for trucking costs to a recycling facility, but the recycling facility takes the material with no charge.

References

- [1] <http://www.epa.gov/ttnchie1/ap42/ch11/final/c11s13.pdf>. Retrieved 11/04/14

Based on	Data Collection	Author	Orange Team Review	Black Team Review
<i>Original Template</i>	<i>Analyst Name</i>	<i>Analyst Name</i>	<i>Analyst Name</i>	<i>Analyst Name</i>
11/20/14				

Fiberglass Mat Waste Disposal

Current Costs

Current Average Mat Waste	(m)	5.68	tons/month	(Rf. 1)
Incremental Waste Disposal Cost	(IC _w)	\$1,840	/ton	(Rf. 2)
Average Annual Waste Disposal Cost	(C _c)	\$125,425	/yr	(Eq. 1)

Proposed Costs

Trucking Cost per Ton-Mile	(C _{TM})	\$1.28	/ton-mile	Rf. 3, N. 1)
Annual Tons	(m _A)	68.2	tons	(Eq. 2)
Distance to Recycling Facility	(d)	700	miles	(N. 2)
Annual Cost	(C _p)	\$61,077		(Eq. 3)

Economic Results

Annual Cost Savings	(S)	\$64,349	/yr	(Eq. 4)
Implementation Cost	(C _I)	\$61,077		(N. 2)
Simple Payback	(t _{PB})	0.9	yr	(Eq. 5)

Notes

N. 1) Assumes the facility will enter into an agreement where waste is recycled for free, but the facility pays for shipping costs. This is a common industrial agreement.

N. 2) Assumes the facility will be able to find a recycler within the state or a neighboring state.

Equations

Eq. 1) Average Annual Waste Disposal Cost (C_c)

$$m \times IC_w \times \frac{12mo}{yr}$$

Eq. 2) Annual Tons (m_A)

$$m \times \frac{12months}{year}$$

Eq. 3) Annual Cost Savings (S)

$$C_{TM} \times m_A \times d$$

Eq. 4) Annual Cost Savings (S)

$$C_C - C_P$$

Eq. 5) Simple Payback (t_{PB})

$$\frac{C_I}{S}$$

References

Rf. 1) Average mat waste per month from June 2013 to October 2014 based on data provided by facility personnel.

Rf. 2) Incremental waste disposal cost for fiberglass mat provided by facility personnel.

Rf. 3) Annual cost per ton mile taken as the annual revenue per ton mile in the trucking industry, US Department of Transportation, 2007.