

# Industrial & Power Plants

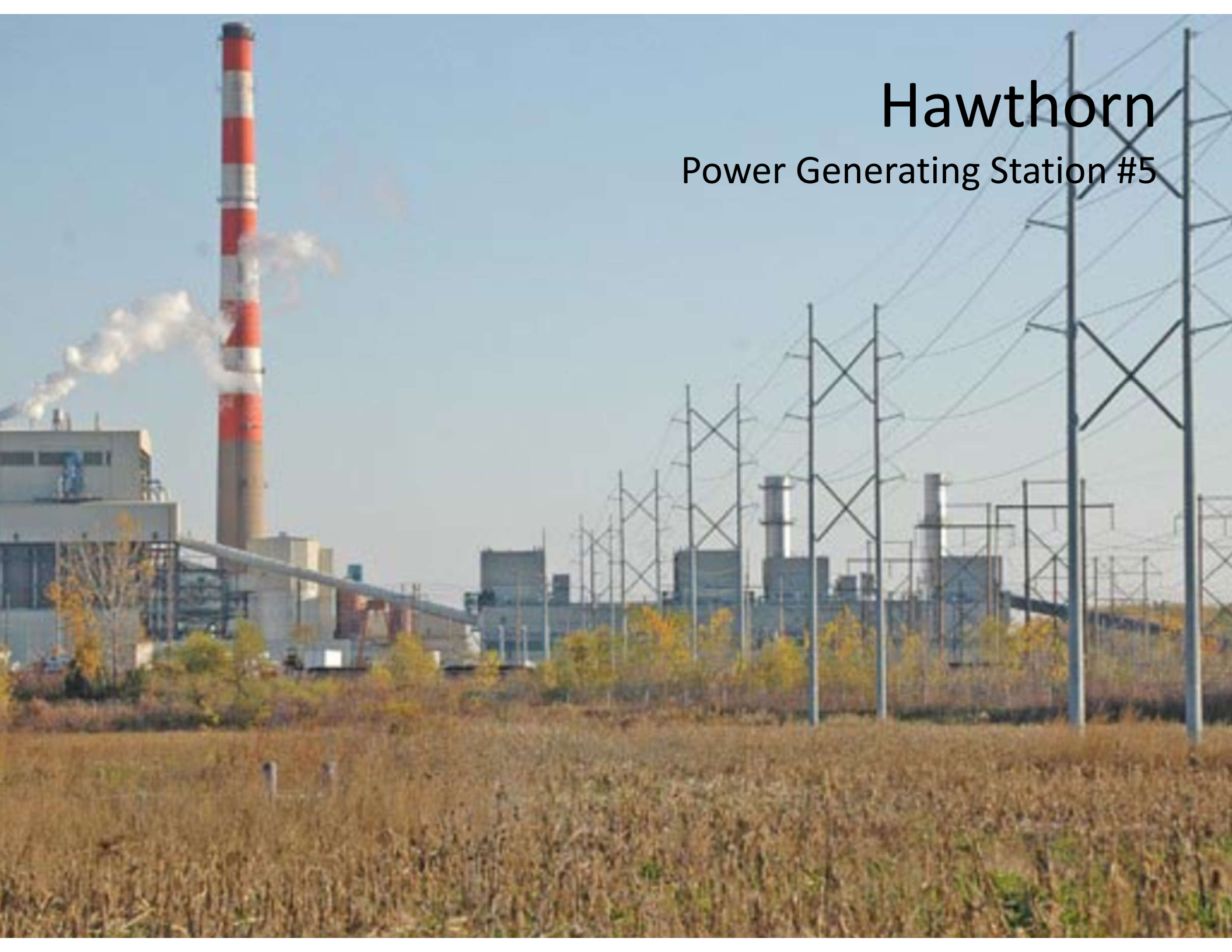
## Cottonwood Air Intake Filter Projects





# Hawthorn

Power Generating Station #5





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### Cottonwood Filter Installation





# Hawthorn Plant

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### Cottonwood Filter Installation Detail





# Hawthorn Plant

## Power Generating Station #5

Completed Installation

Track Mount on three sides, bottom and top for easy access and a uniform, snug fit.

Roller Track on the top of all sides permits easy access.



# Hawthorn Plant

## Power Generating Station #5

Cottonwood Filters Working  
on the Outside

Cottonwood accumulating on the top and sides.  
It is beginning to roll off in clusters





# Hawthorn Plant

## Power Generating Station #5

Cottonwood Filters Working Real Well  
on the Outside

Without the air intake filters, the cottonwood used to accumulate on the steam coils inside

Next, let's look inside at the heat-recovery pre-heat coils.





# Hawthorn Plant

## Power Generating Station #5

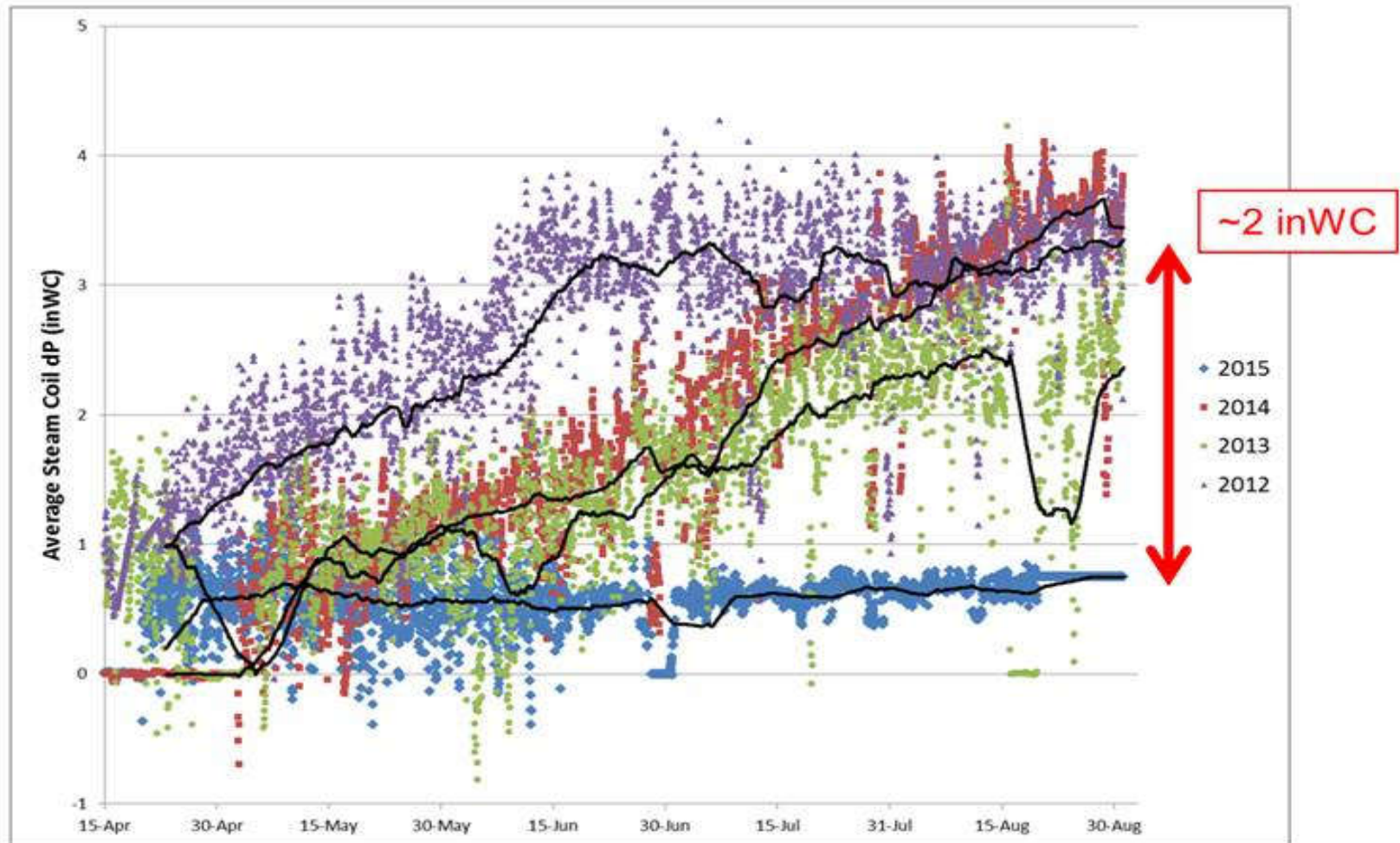
Cottonwood Filters Working Real Well  
on the Steam Preheat Coils

"I had to take the unit off this weekend for an unrelated issue and was able to inspect preheat coils yesterday. See attached - they are staying very clean. I sort of knew this already since I was monitoring dP, but this was a good validation. We have also had some pretty hot weather and our FD fans have not run into any limitations. So for now, the filters are working great and this project is looking like a success. Thanks again for all your help."

**A SIDE COILS, BOTTOM  
LOOKING UP**



# STEAM COIL PLUGGAGE dP



“We eliminated the pressure loss across our steam coils caused by the cottonwood seeds and other airborne debris. This is worth about 200+ kW in fan power when we are running full load – but more importantly, we are not dealing with the corresponding reduced fan capacity.”



# Hawthorn Plant

## Power Generating Station #5

the project is a big success

200 kW in Fan Power  
8,750 Hours of Operation  
 1,750,000 kWh's  
 \$ 0.10 Mkt. Value of Energy (\$/kWh)  
 \$175,000.00 Fan Power Energy Savings

“The bigger issue for us is that reduced fan capacity can sometimes contribute to reduced power output from our station (we measure that in Megawatts).”

500 MW  
 1,000 Megawatt Multiplier to get kilowatts  
 500,000 kW  
 8,750 Hours of Operation  
 4,375,000,000 kWh's  
 1.0% Production Loss  
 43,750,000 Production Loss in kWh  
 \$ 0.10 Mkt. Value of Energy (\$/kWh)  
 \$ 4,375,000.00 Lost Revenue / 1%  
 \$ 250,000.00 Installation Cost  
 5.714%  
 365 Days/Year  
 20.86 ROI in Days

500 MW  
 1,000 Megawatt Multiplier to get kilowatts  
 500,000 kW  
 8,750 Hours of Operation  
 4,375,000,000 kWh's  
 1.0% Production Loss  
 43,750,000 Production Loss in kWh  
 \$ 0.10 Mkt. Value of Energy (\$/kWh)  
 \$ 4,375,000.00 Lost Revenue / 1%  
 \$ 500,000.00 Installation Cost  
 11.429%  
 365 Days/Year  
 41.71 ROI in Days