

Midwest Soil Improvement Symposium:

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Research and Practical Insights into Using Gypsum

How Gypsum is Produced

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We Energies Gypsum Production



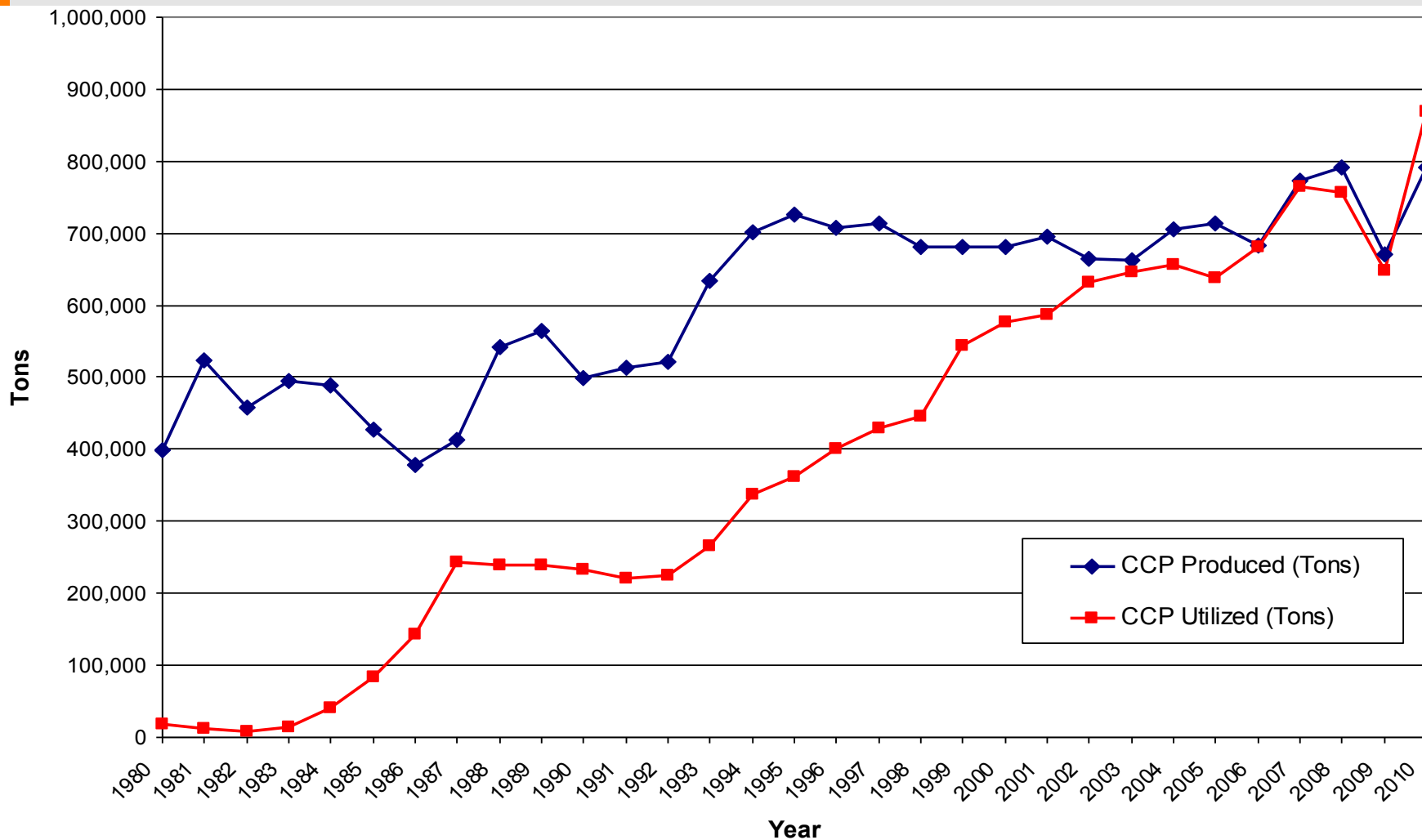
Bob Paulson - We Energies
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Coal Combustion Products (CCP)

- CCP are byproduct materials produced at coal fired power plants that we plan to **beneficially utilize**
- We Energies CCP include:
 - Bottom ash
 - Fly Ash
 - Gypsum
- We Energies Plants can produce nearly 1.5 million tons of CCP annually



We Energies Coal Combustion Products Production and Utilization



Background

- Production of gypsum part of flue gas desulfurization (FGD) process that removes SO_2 (acid rain) from flue gas
- Currently operating at:
 - Pleasant Prairie Power Plant (PPPP)
 - Oak Creek Expansion Plant (OCXP: aka ERGS)
- Under construction at Oak Creek Power Plant (OCPP)



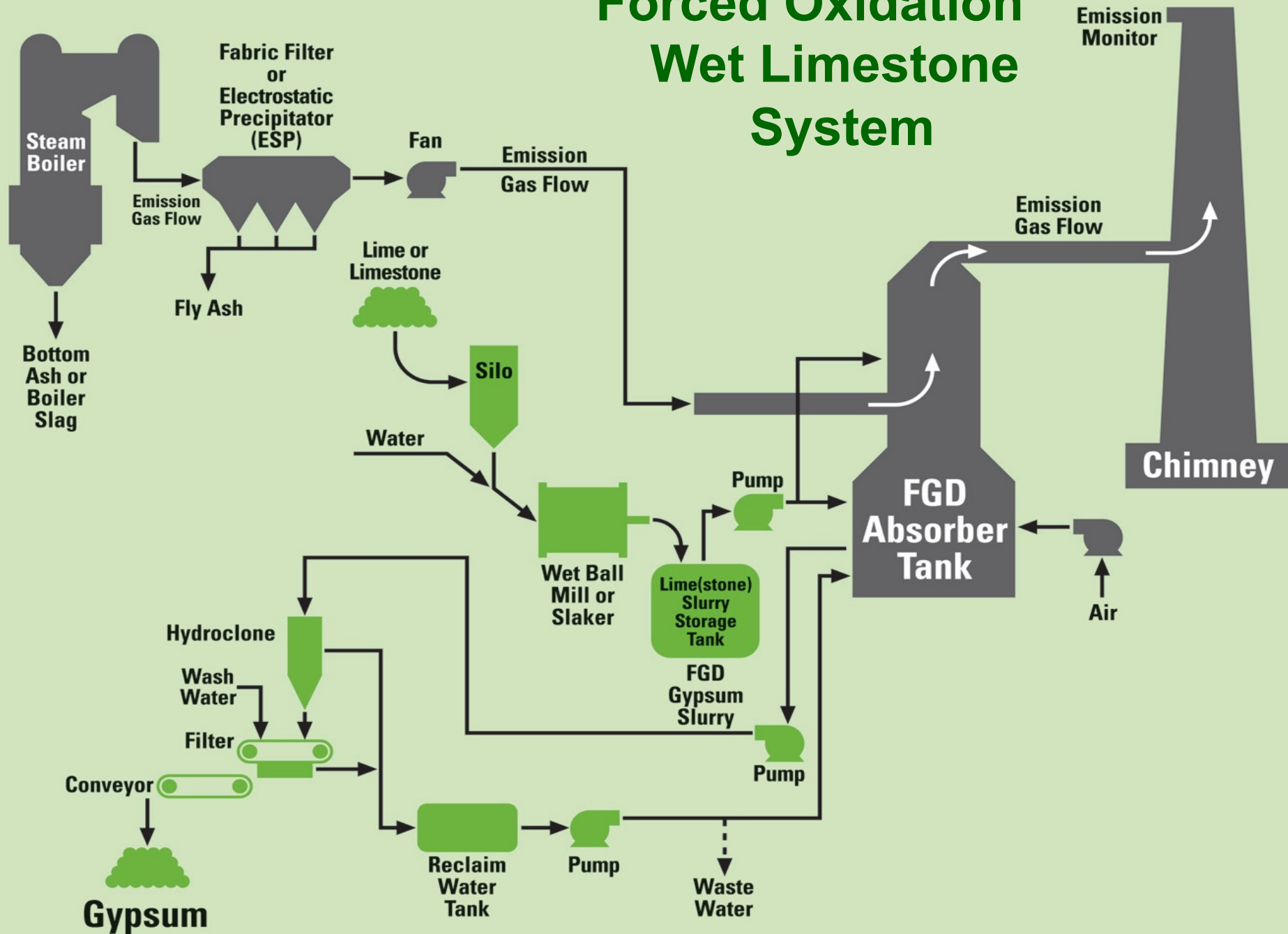
FGD Process

- All We Energies FGD process are forced oxidation wet limestone systems
- Process starts with high quality limestone
 - $>95\%$ CaCO_3
 - $<2\%$ MgCaCO_3
- Preceded by particulate (fly ash) removal and NO_x removal systems

Forced Oxidation Wet Limestone Reactions

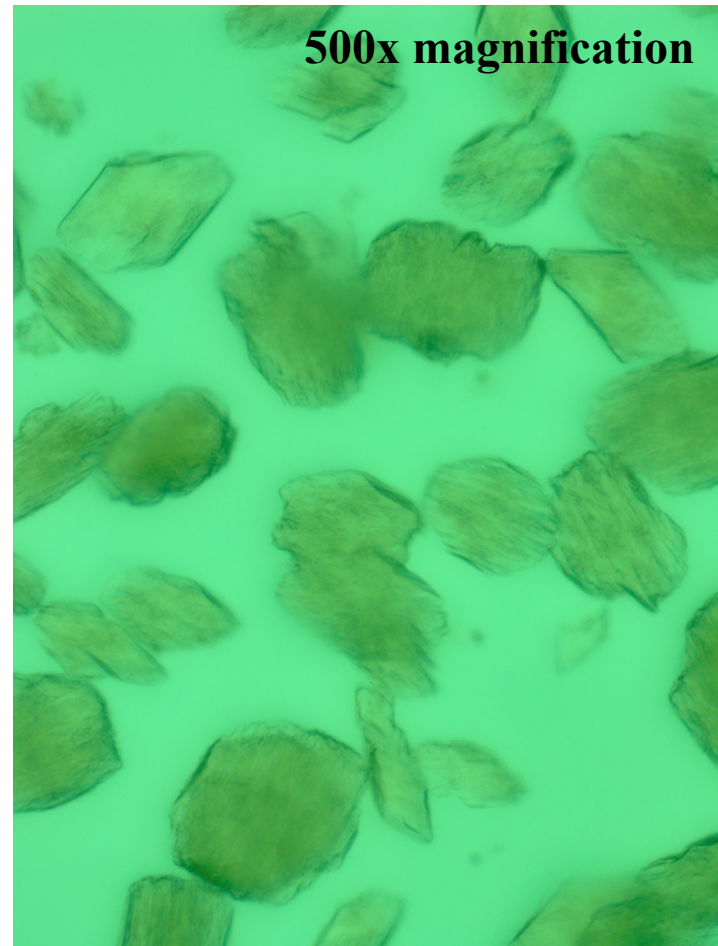
- CaCO_3 (solid) + SO_2 (gas) \rightarrow CaSO_3 (solid) + CO_2 (gas)
- CaSO_3 (solid) + H_2O (liquid) + 0.5O_2 (gas) \rightarrow $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (solid) = gypsum

Forced Oxidation Wet Limestone System



End Product

- > 95% (dry basis)
pure gypsum
- 5 to 10% moisture
- Particle size
averages 40-60
microns

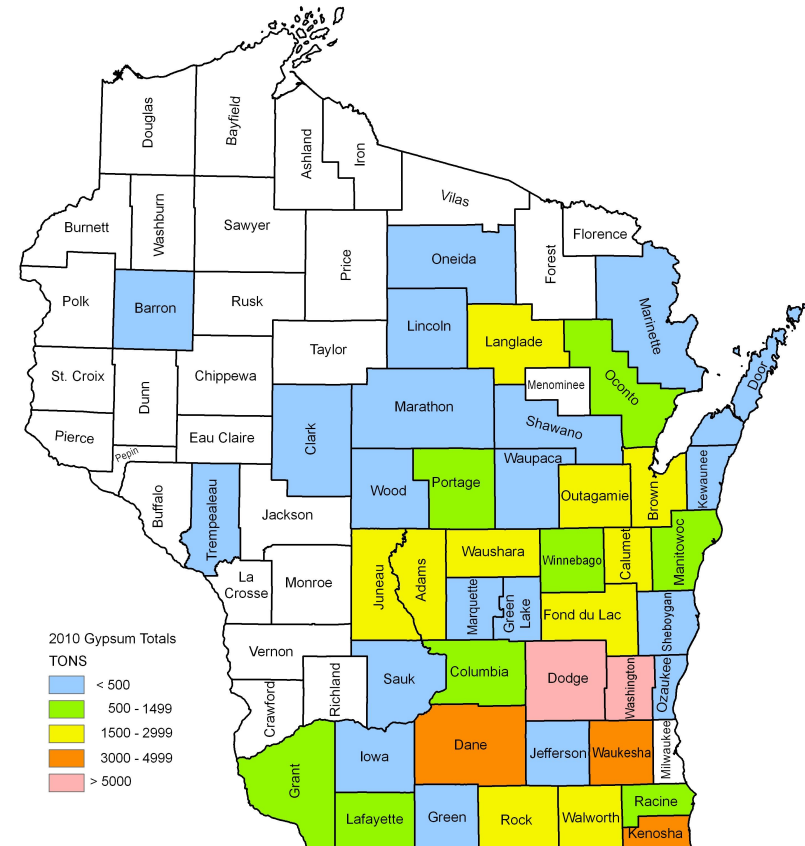


Differences from dry scrubber residuals

- Produces only CaSO_3
- Typically use lower purity limestone resulting in higher Mg concentrations
- Usually higher concentration of fly ash as process often done in conjunction with particulate (fly ash) removal

We Energies Agricultural Gypsum Use

- Marketed and distributed through Gypsoil
- WDNR, WDATCP and IEPA approvals and licenses
- Approximately 60,000 tons distributed in 2010
- Used in 43 of 72 WI counties in 2010



Gypsoil Raffle

- Enter at Gypsoil Booth
- 2 prizes of 5 truck loads each (100 - 125 tons total)
- Can deliver to more than one location but individual truck load can not be split
- Delivery scheduled through Gypsoil to locations We Energies has approval
- Absolutely free, all you have to do is spread it.

