ENERGY CENTER
OF WISCONSIN

Anaerobic Digestion of Food Industry Waste

Renewable Energy Education Field Day
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Madison, Wisconsin

Food Industry Digesters

- Used by several food industries:
  - Cheese production
  - Brewing
  - Fruit and vegetable processing
  - Meat processing
  - Sugar production
  - Dough products
  - Grain processing
  - Snack food production

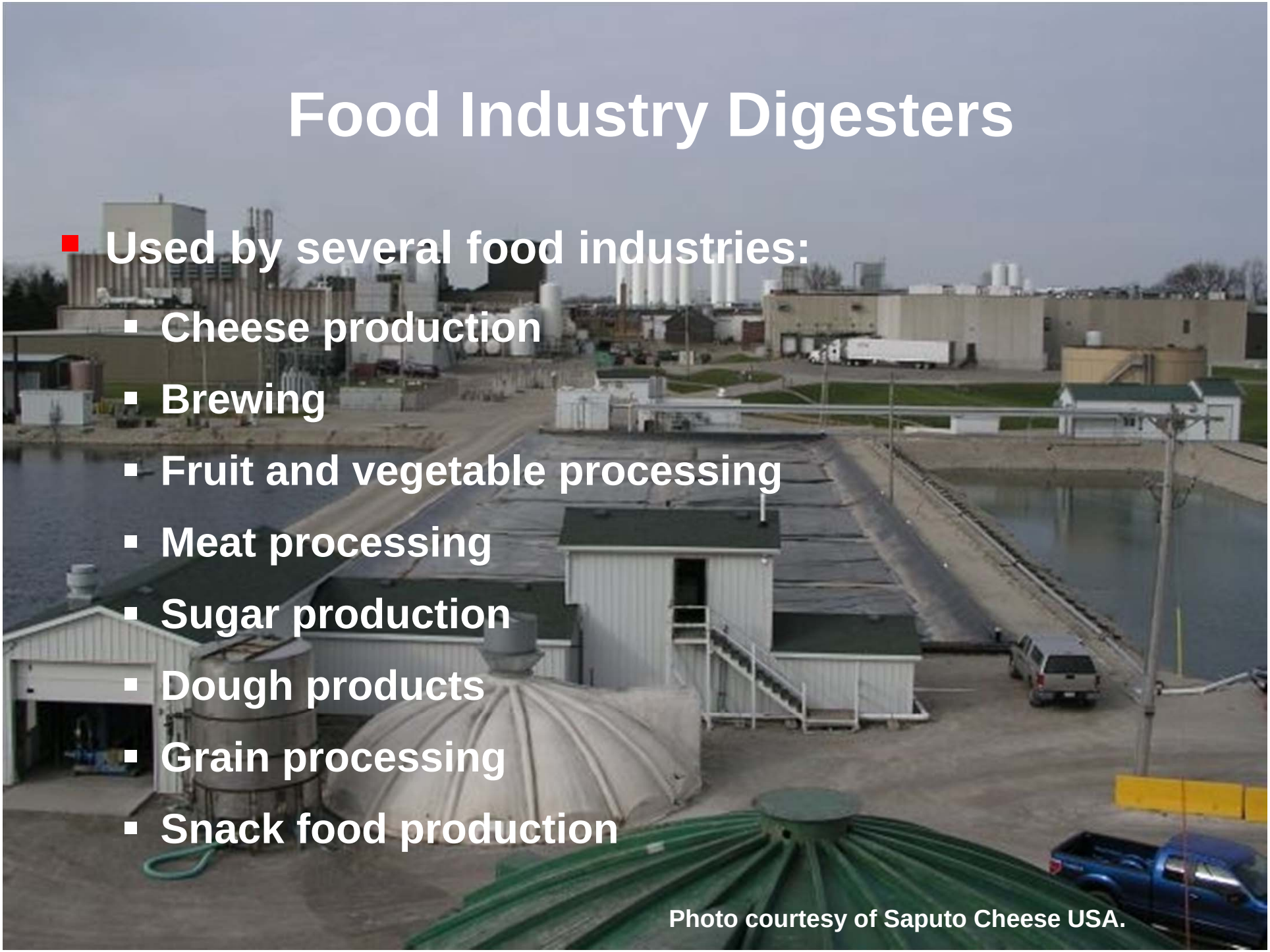
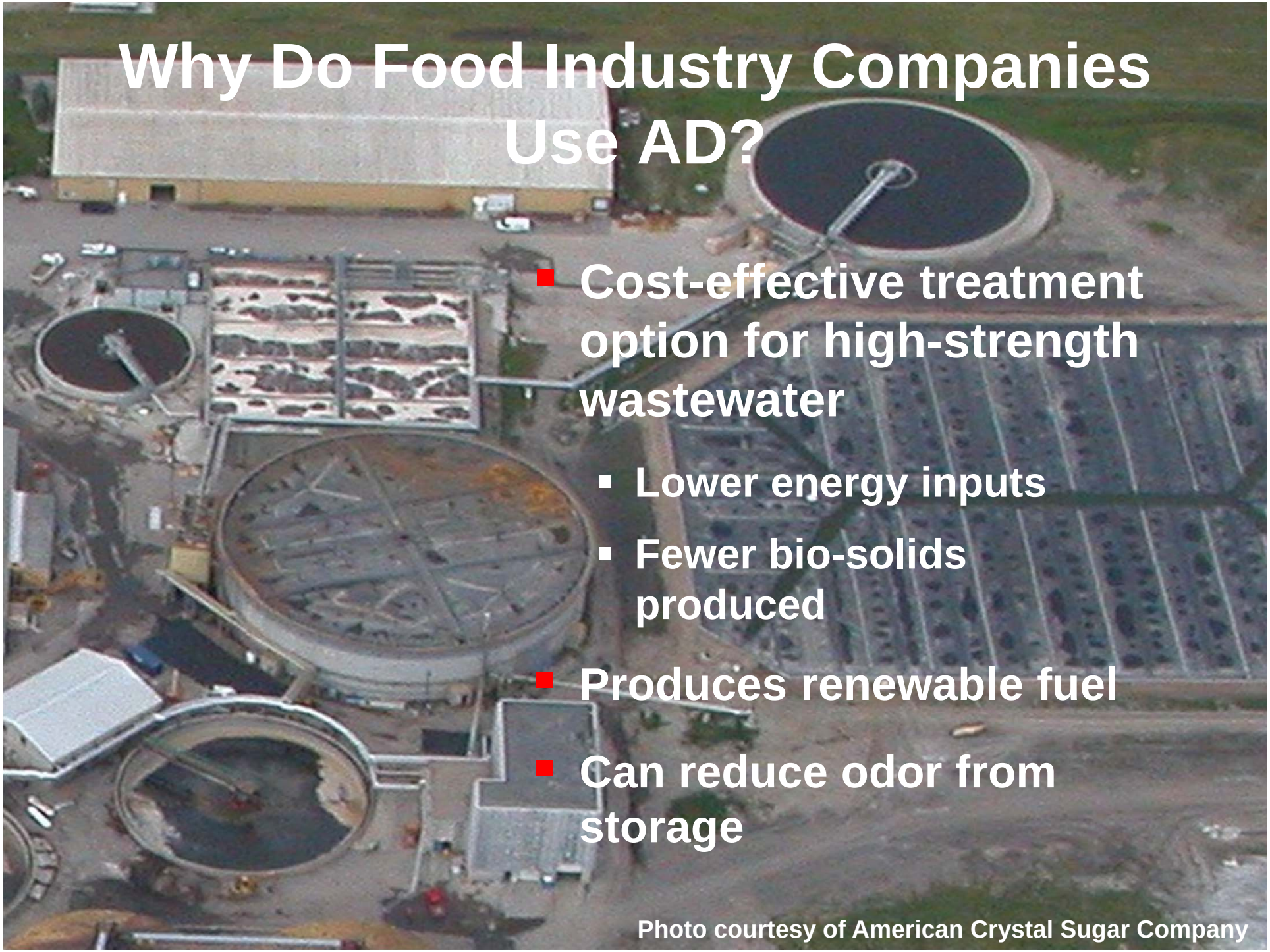


Photo courtesy of Saputo Cheese USA.

Why Do Food Industry Companies Use AD?



- Cost-effective treatment option for high-strength wastewater
  - Lower energy inputs
  - Fewer bio-solids produced
- Produces renewable fuel
- Can reduce odor from storage

Photo courtesy of American Crystal Sugar Company

How AD Is Used

- Primary stage of on-site multi-stage treatment system
- Pre-treatment of WW to reduce WWTP costs
- Food production residue/WW sent to other system owner
  - Farm digesters (Ridgeline Dairy, NY; Holsum Dairy, WI; Five Star Dairy, WI)
  - Third-party digester owner/developer

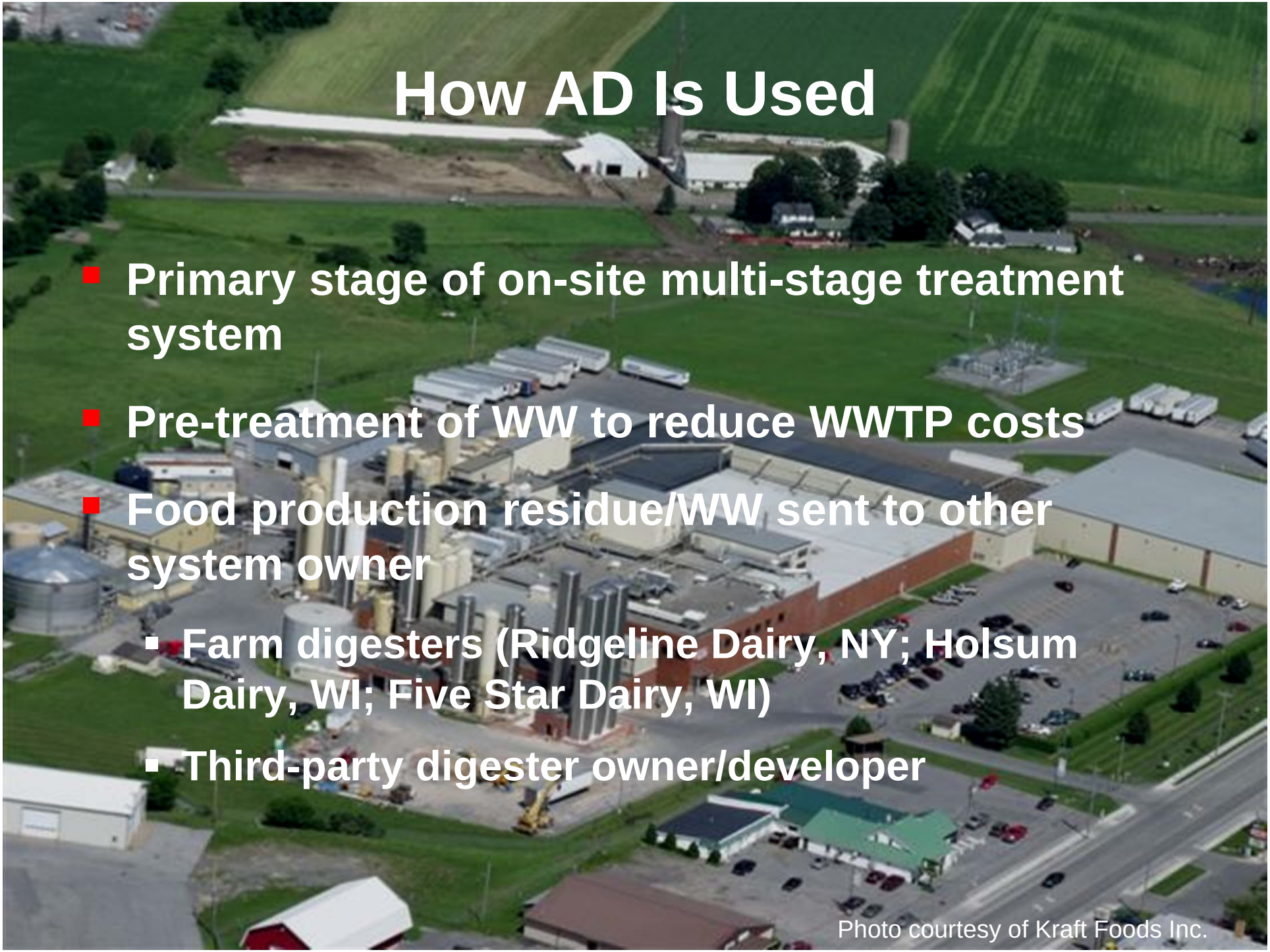
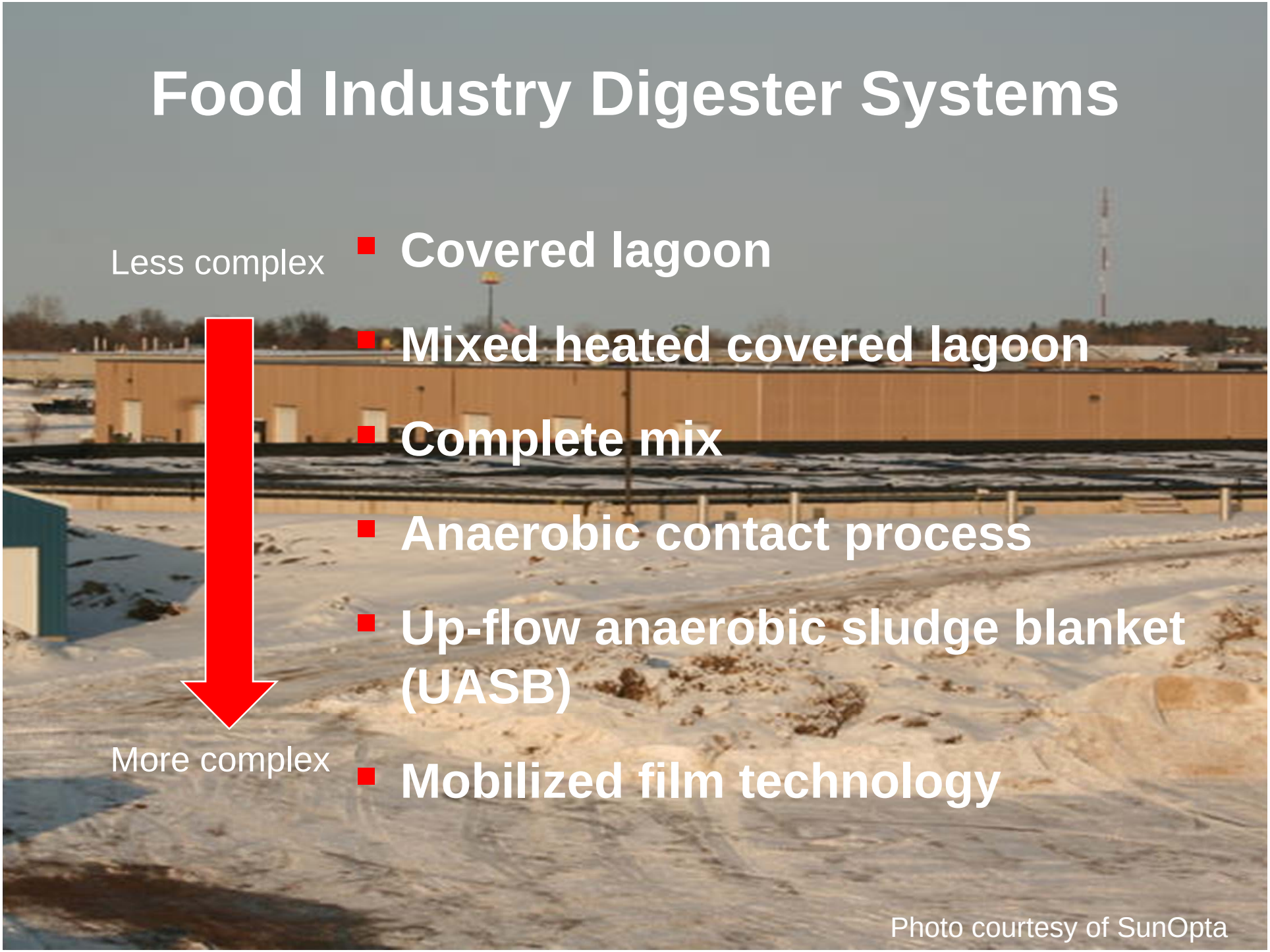


Photo courtesy of Kraft Foods Inc.

Food Industry Digester Systems



- Covered lagoon
- Mixed heated covered lagoon
- Complete mix
- Anaerobic contact process
- Up-flow anaerobic sludge blanket (UASB)
- Mobilized film technology

Saputo Cheese USA

- Waupun, WI
- Mixed, heated, covered lagoon, (1991, 2009) HRT 5-6 days
- >100k cfd biogas, scrubbed, fuels boiler for digester heat
- Primary onsite treatment – after full treatment liquid is dischargeable

Photo courtesy of Saputo USA Inc.

JBS Green Bay, Beef Production

- Green Bay, Wisconsin
- Anaerobic contact process (1987), pre-treatment prior to city WWTP
- HRT ~2 days
- AD gives JBS control over WW treatment costs

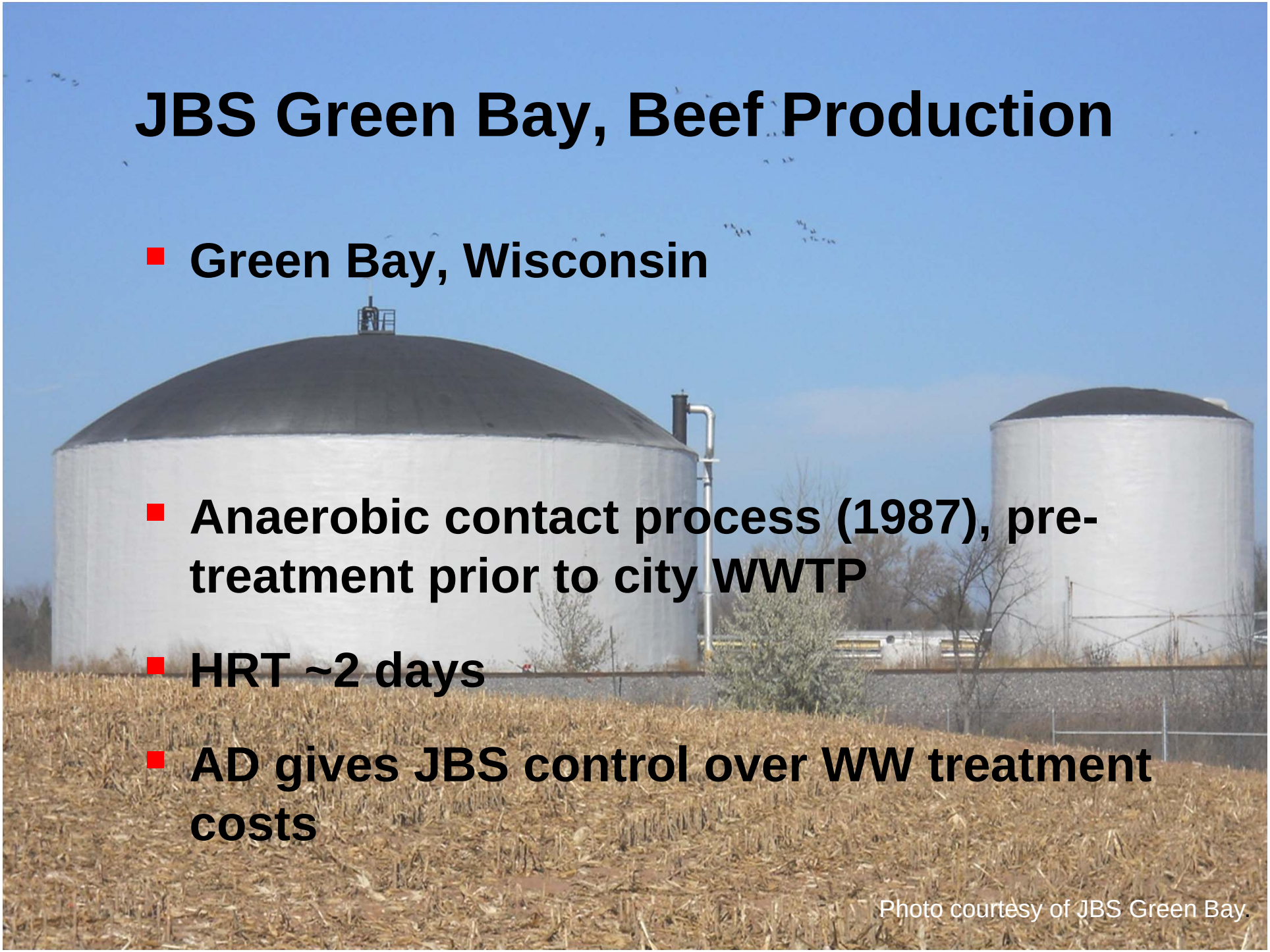
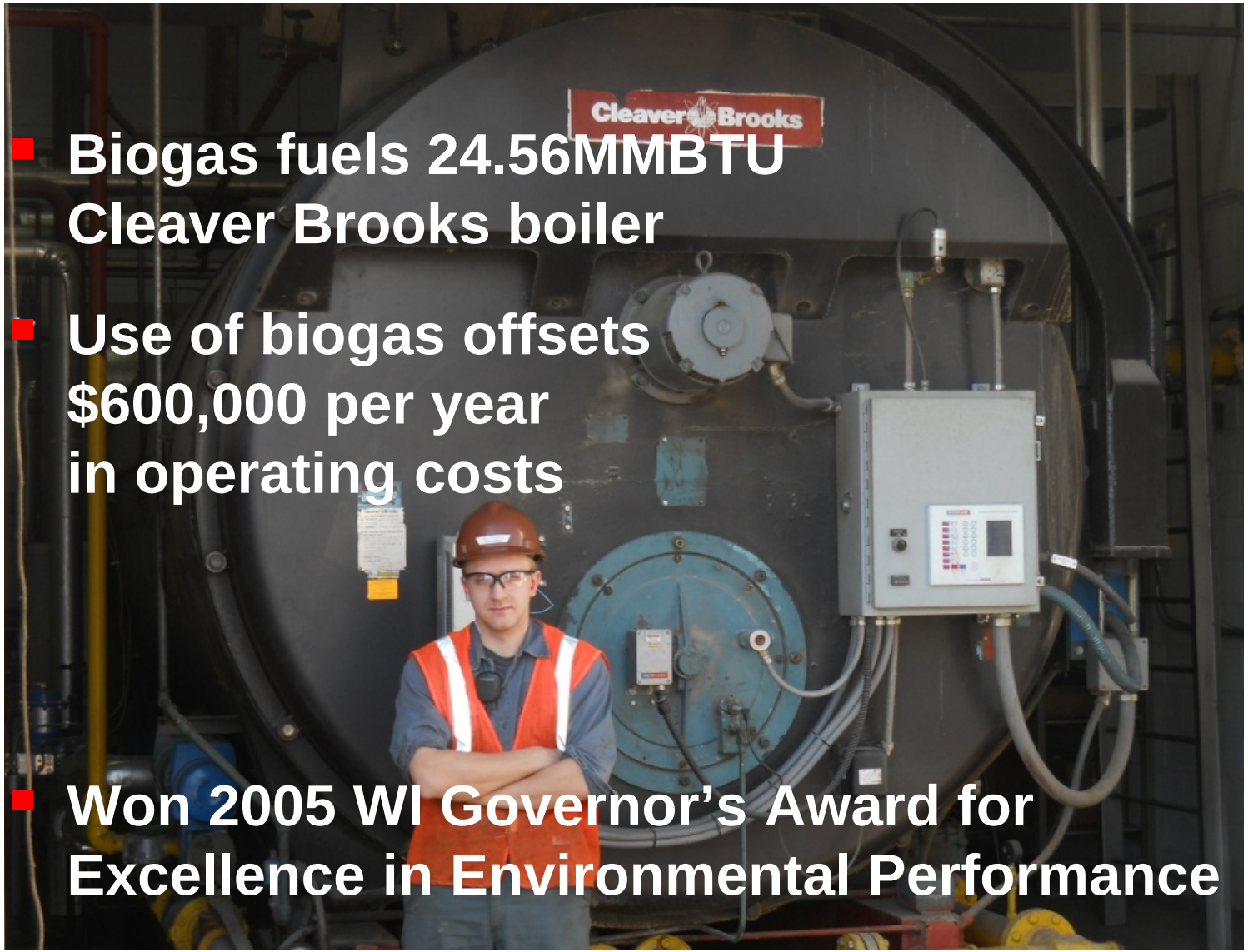


Photo courtesy of JBS Green Bay.

JBS Green Bay (continued)

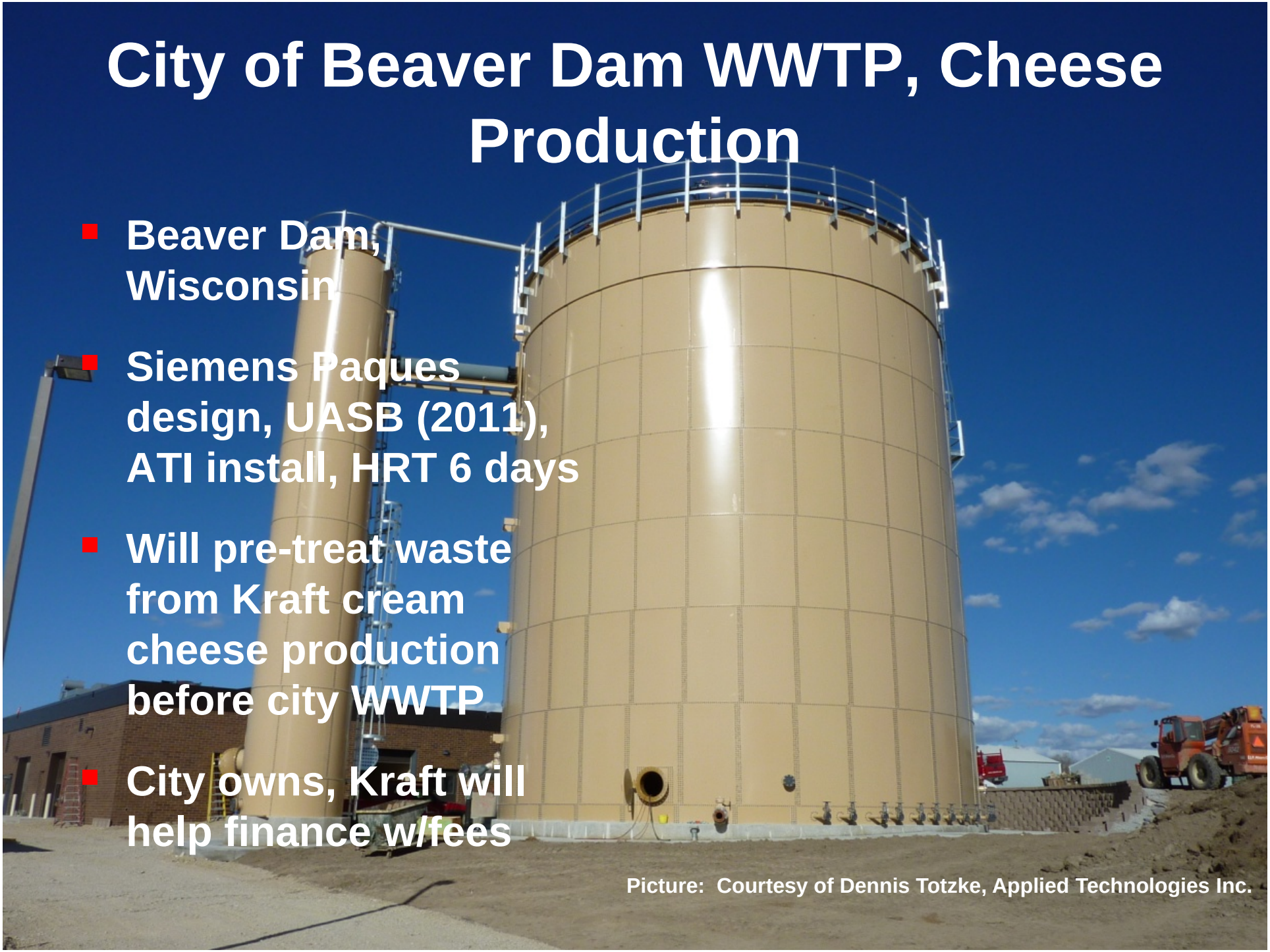


- Biogas fuels 24.56MMBTU Cleaver Brooks boiler
- Use of biogas offsets $600,000 per year in operating costs
- Won 2005 WI Governor's Award for Excellence in Environmental Performance

Picture: Courtesy of JBS Green Bay.

City of Beaver Dam WWTP, Cheese Production

- Beaver Dam, Wisconsin
- Siemens Paques design, UASB (2011), ATI install, HRT 6 days
- Will pre-treat waste from Kraft cream cheese production before city WWTP
- City owns, Kraft will help finance w/fees



Picture: Courtesy of Dennis Totzke, Applied Technologies Inc.

City of Beaver Dam WWTP (continued)

- Electricity sold to Alliant Energy
- Heat used for influent WW and digester
- Cost savings for all over alternatives
- Nearly cost-neutral for residents

Photo: Courtesy of Wayne Karlovich, Applied Technologies, Inc.

City Brewery / Gundersen Lutheran

- La Crosse, Wisconsin
- Installed two Biothane UASB digesters (1982) for pre-treatment, HRT 4.4 hours
- Gundersen Lutheran proposed to install generation (633kW)
- GL sells electricity to Xcel Energy
- CB uses heat on site

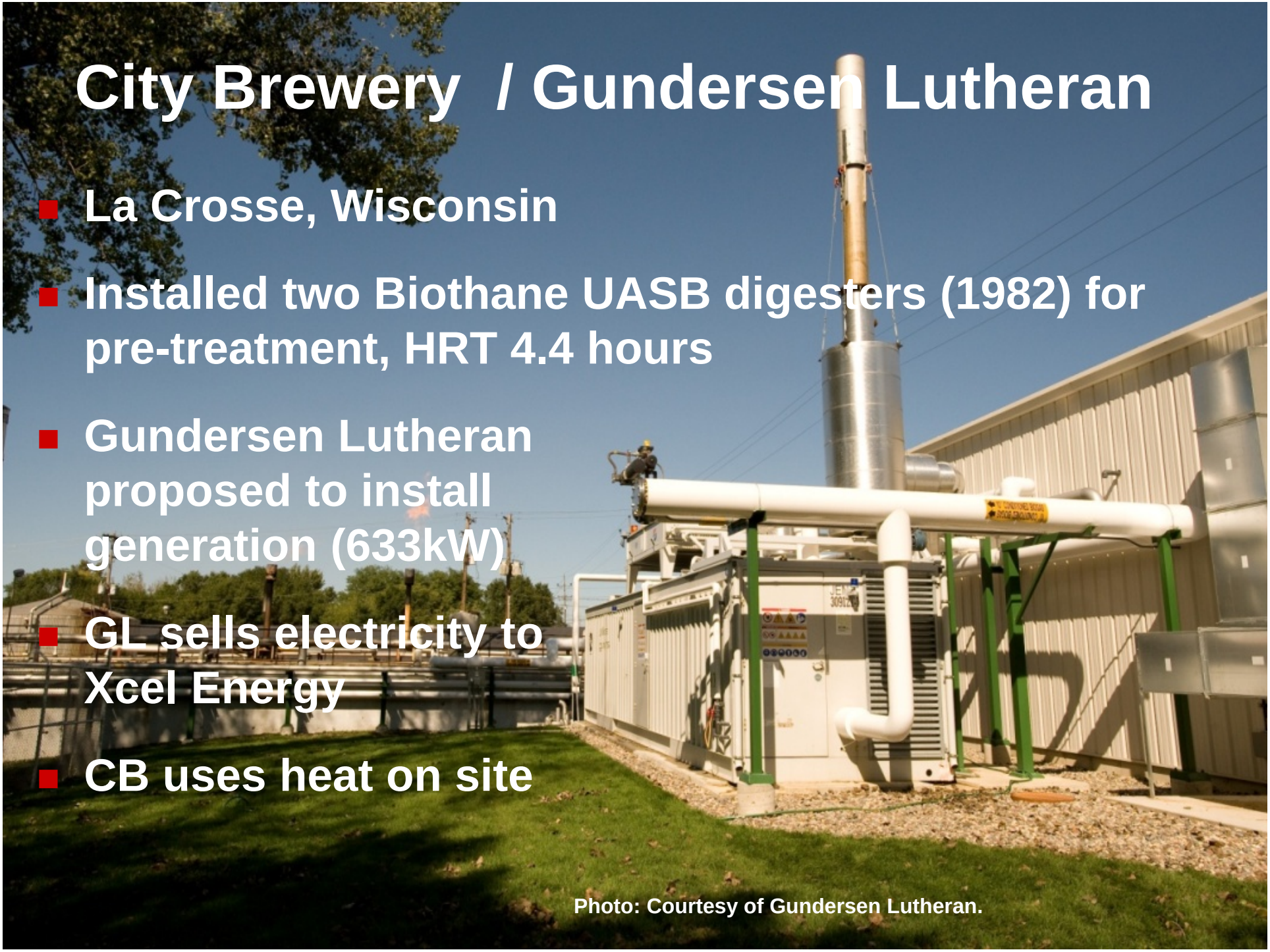
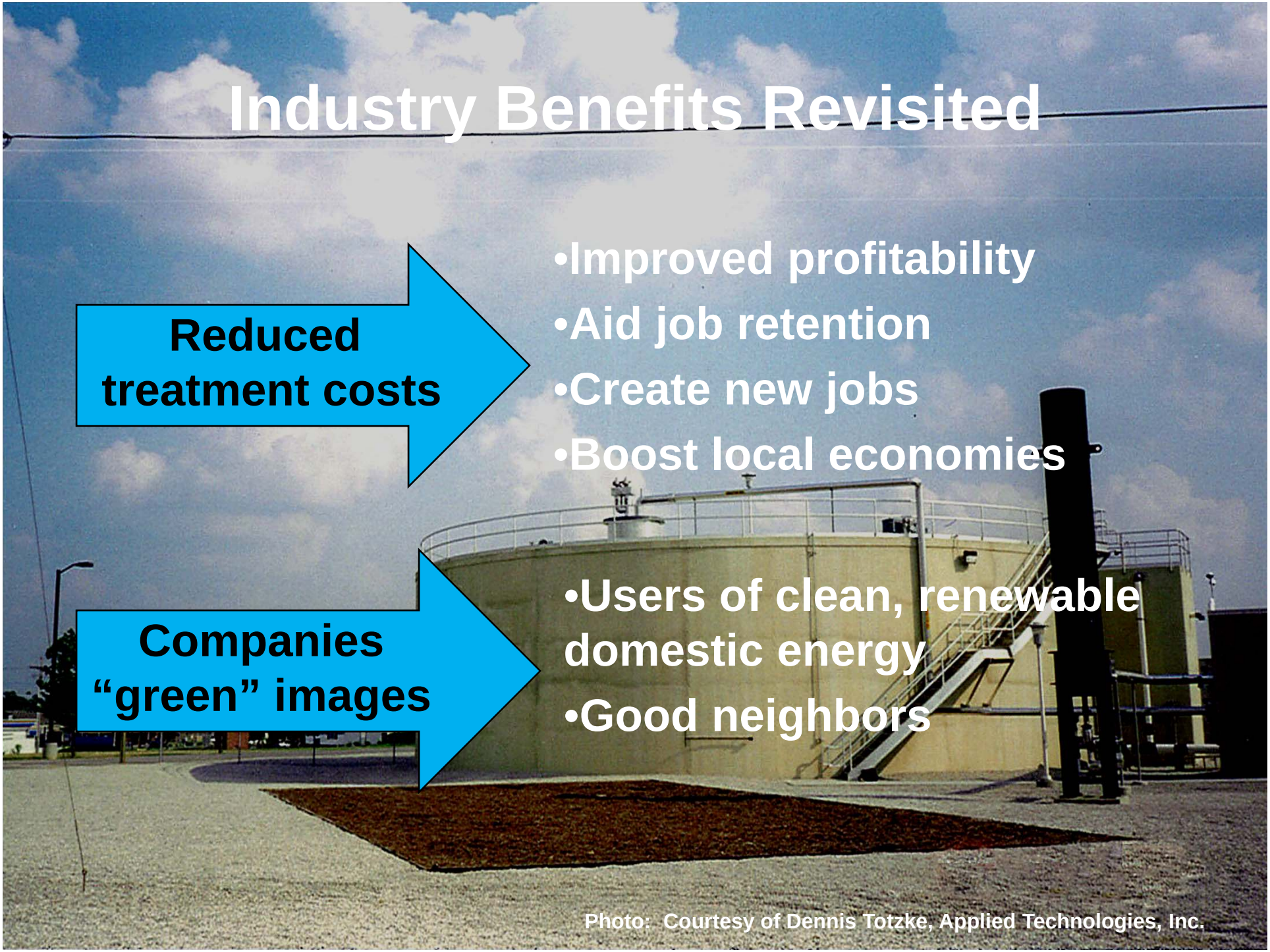


Photo: Courtesy of Gundersen Lutheran.

Industry Benefits Revisited



Reduced treatment costs

- Improved profitability
- Aid job retention
- Create new jobs
- Boost local economies

Companies "green" images

- Users of clean, renewable domestic energy
- Good neighbors

Photo: Courtesy of Dennis Totzke, Applied Technologies, Inc.

Contact and Resources

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