Energy Sustainability

Experience at the Downers Grove Sanitary District

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Education Seminar

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Downers Grove Sanitary District

Agenda

- Background
- Improved Efficiency / Energy Reduction
- Energy Production / Use Of Resources

Downers Grove Sanitary District

- 11/22 MGD average/peak full treatment capacity
- Primary clarification
- Single-stage nitrification
- Tertiary sand filtration
- *Oversized* anaerobic digestion
- Sludge dewatering and aging
- Excess flow primary and disinfection to 110 MGD total

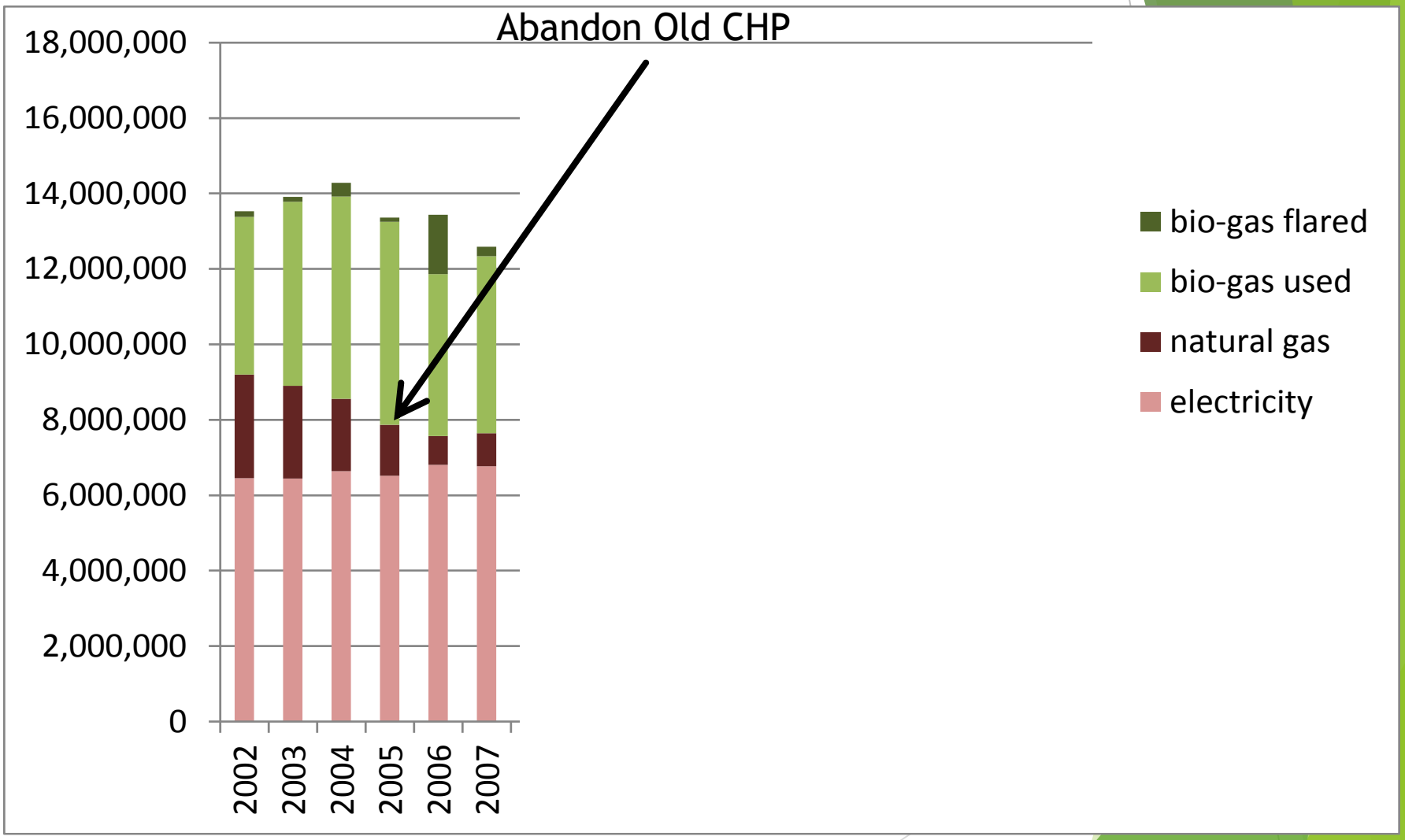
The Management Challenge

- Energy: 15% of operating budget
- Cost-effective reductions: good business practice / expected by rate payers
- Synergies
  - Staff skills
  - Automation/controls
  - Existing energy infrastructure
  - Available technologies
  - External funding

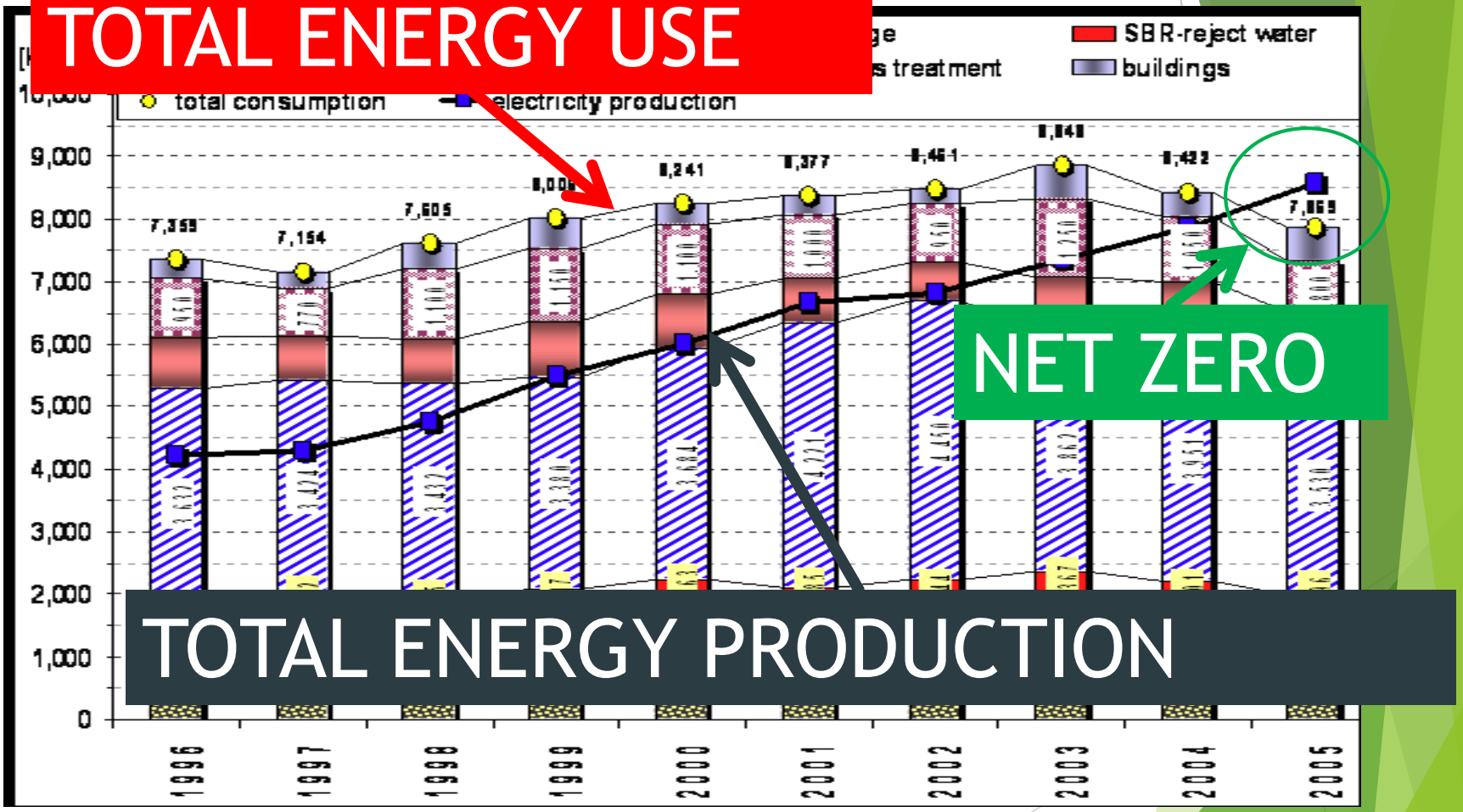
Energy Types and Needs

- Electricity
  - Pumping
  - Aeration
  - Other process
- Natural Gas
  - Heating – Building
- Digester Gas
  - Heating - Process

Historic Energy Use



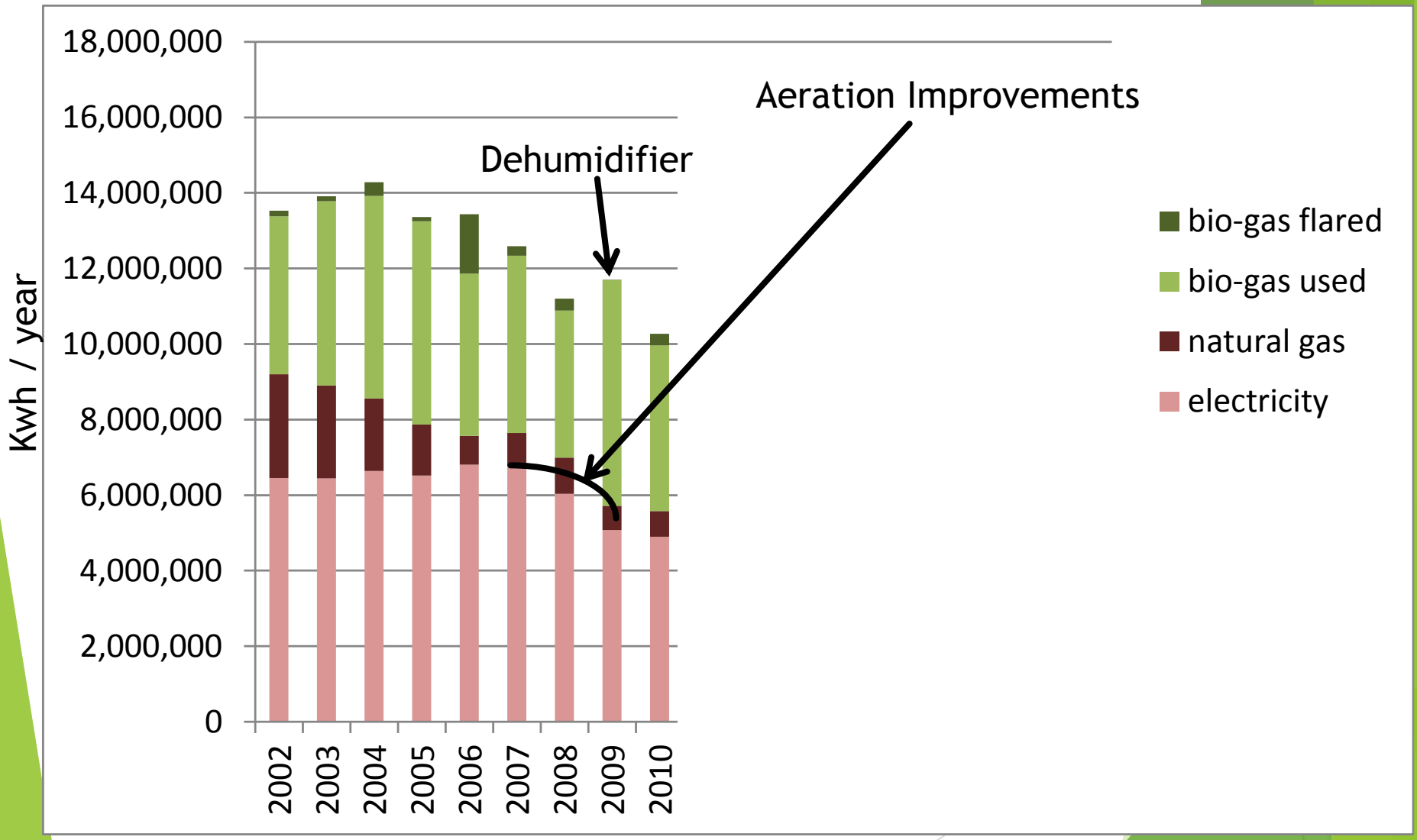
Model Program – Strass, Austria



Initial Focus: Energy Reduction/Efficiency

- Aeration System Improvements – 7 year payback on $1 million (after $250,000 grant)
- Pumping Station VFDs – 3 year payback on $50,000 (after $20,000 grant)
- Lighting Upgrades – 3 year payback on $25,000 (grant funding varies)
- HVAC
  - Desiccant Dehumidifier – 8 year payback on $100,000
  - Geothermal/Effluent Water Heat Pumps – 0 year payback (replacement program as old units fail - $5,000 per year)
  - Absorption Chiller – 7 year payback on $10,000
- MORE TO COME

Energy Reduction Trend



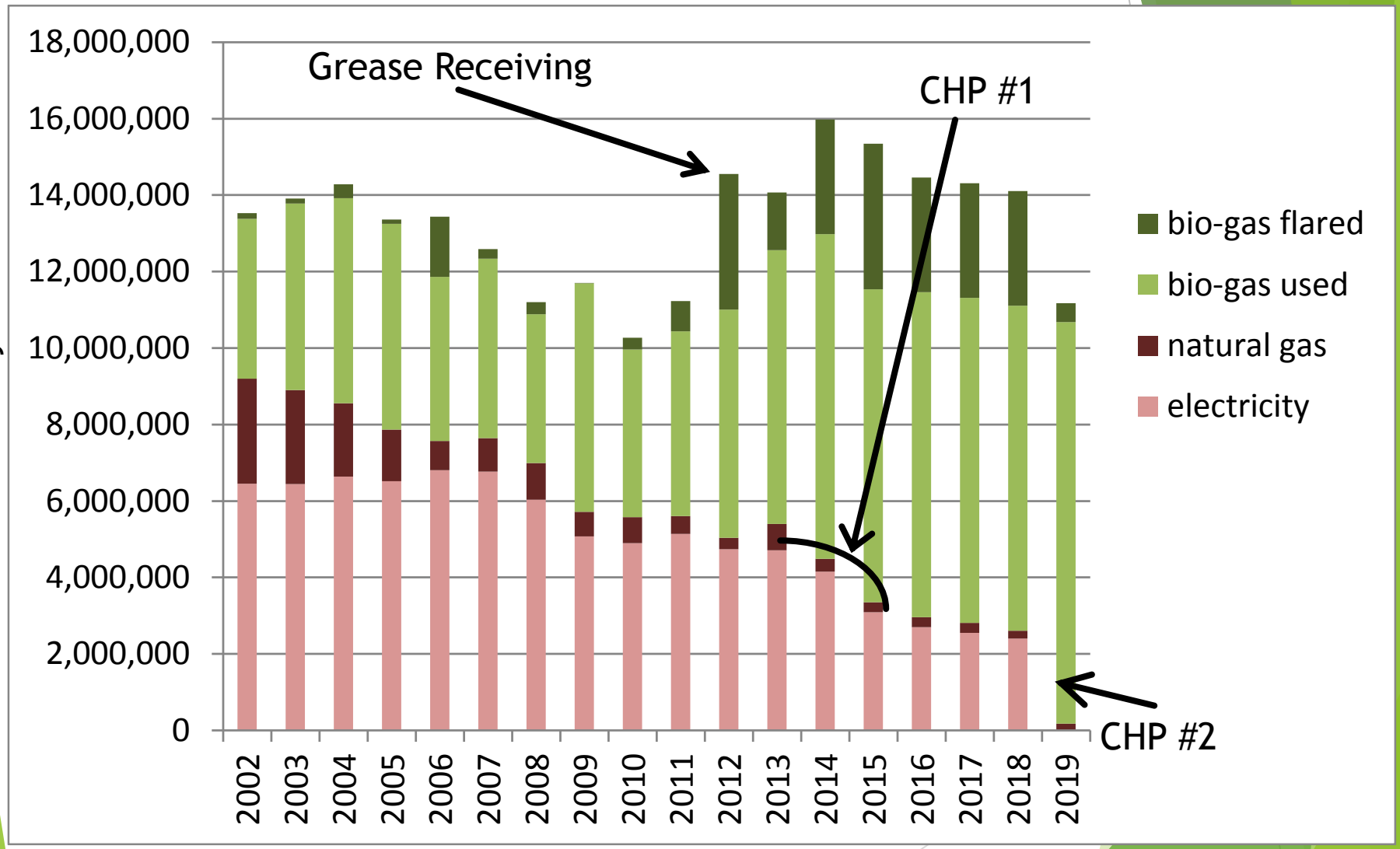
Current Focus: Energy Production
Available Resource: Sludge

- Incineration – need to dewater first – net energy concerns
- Bio-fuel cell – very early stages of development
- Improved Gas Production
  - More feed stock (grease, food, etc)
  - Improved feed stock (WAS lysis)
  - Better digester mixing

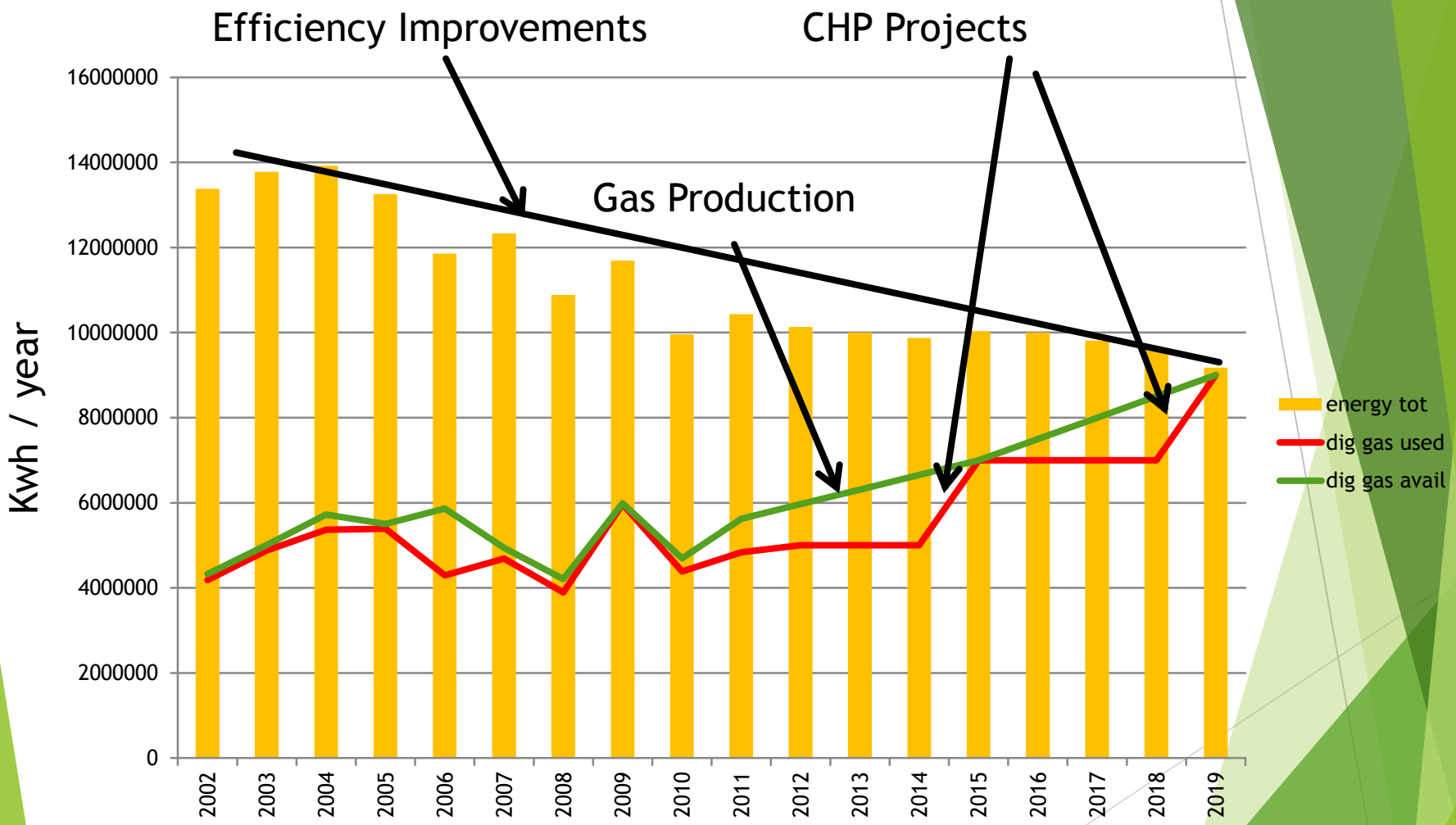
Energy Generation Projects

- Goal: Produce sufficient energy to meet reduced energy demand
- FOG/Food Waste Receiving Station = Increased Biogas Production – ARRA funding
- Combined Heat and Power - $496,000 grant funding so far
  - Electricity Generation
  - Digester Heating

Energy Production and Use



Matching the Model



Conclusions

- Energy is a controllable expense
- Energy reduction technologies are compatible with wastewater O&M skill-sets
- Energy reduction is cost-effective
- Opportunities of all sizes are available
- Grant / other funding opportunities continue

Questions

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