Supplemental Material
Received at the Meetings of
City Council
Redevelopment Agency
Housing Authority
Financing Authority

For

April 29, 2008

Item #18: Waste to Energy (WTE) Program

a. Presentation by Dr. Emir Macari, Dean of Engineering at California State University Sacramento, regarding Waste to Energy pathways and technologies.
b. Presentation by Dr. Gary C. Young, Licensed Engineer and Inventor, regarding processes for the management of municipal solid waste.
c. Presentation by Dr. Louis Circeo, Director of the Plasma Applications Research Program at Georgia Tech Research Institute, regarding Plasma Arc Gasification of municipal solid waste
d. Information handout by Dr. Dan Pellissier with the CalEPA regarding plasma project under development.

Item #24: Sacramento Foreclosure Trends and Potential Local Initiatives

a. PowerPoint presented by SHRA staff.

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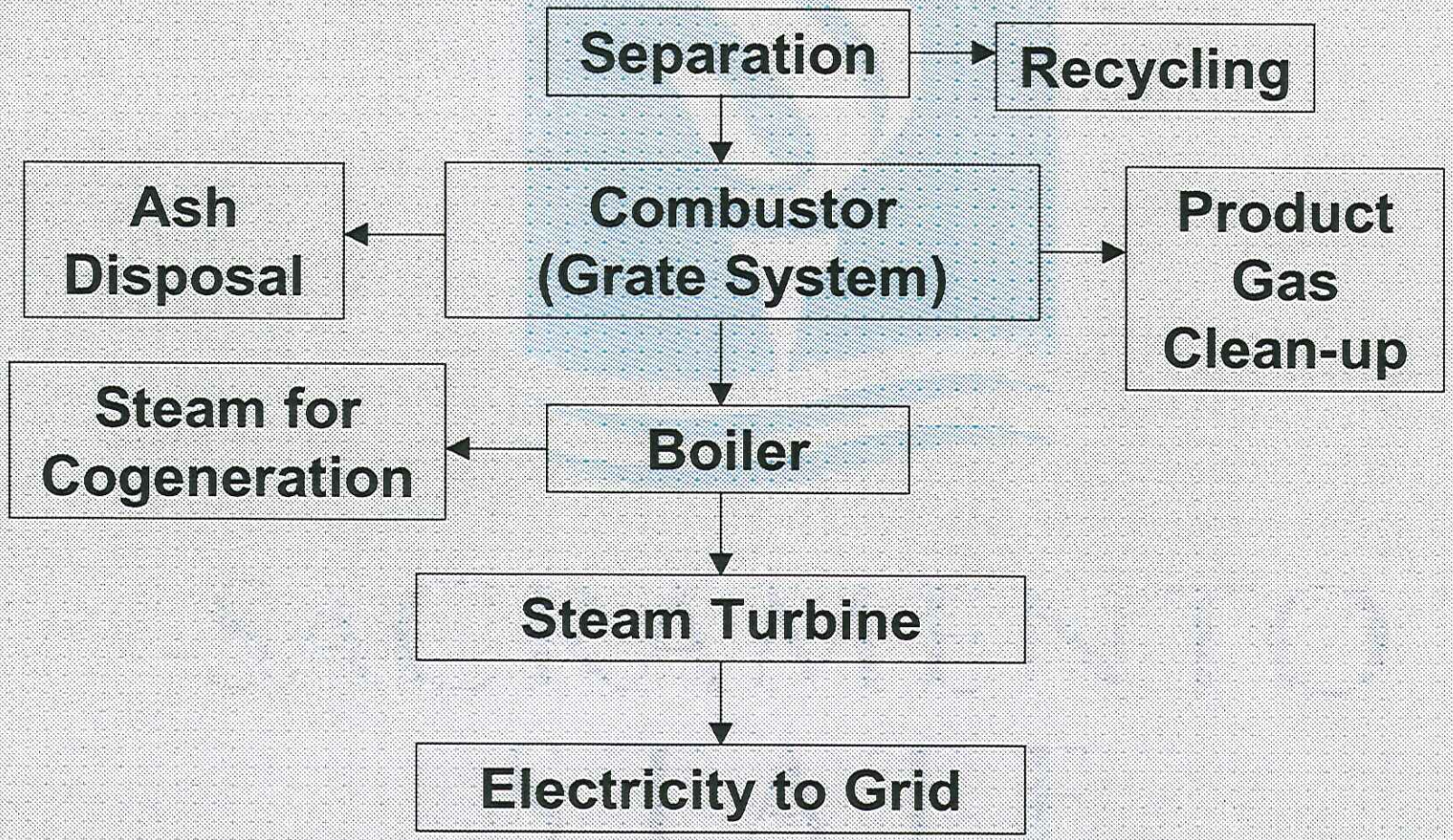
City of Sacramento
Waste to Energy Project

- WTE Pathways and Technologies
- Comments/Feedback on RFQ
- Recommendations

WTE Pathways and Technologies

1. Direct Incineration



WTE Pathways and Technologies

1. Direct Incineration

Advantages

- Simple and Proven Technology
- Cost-Effective

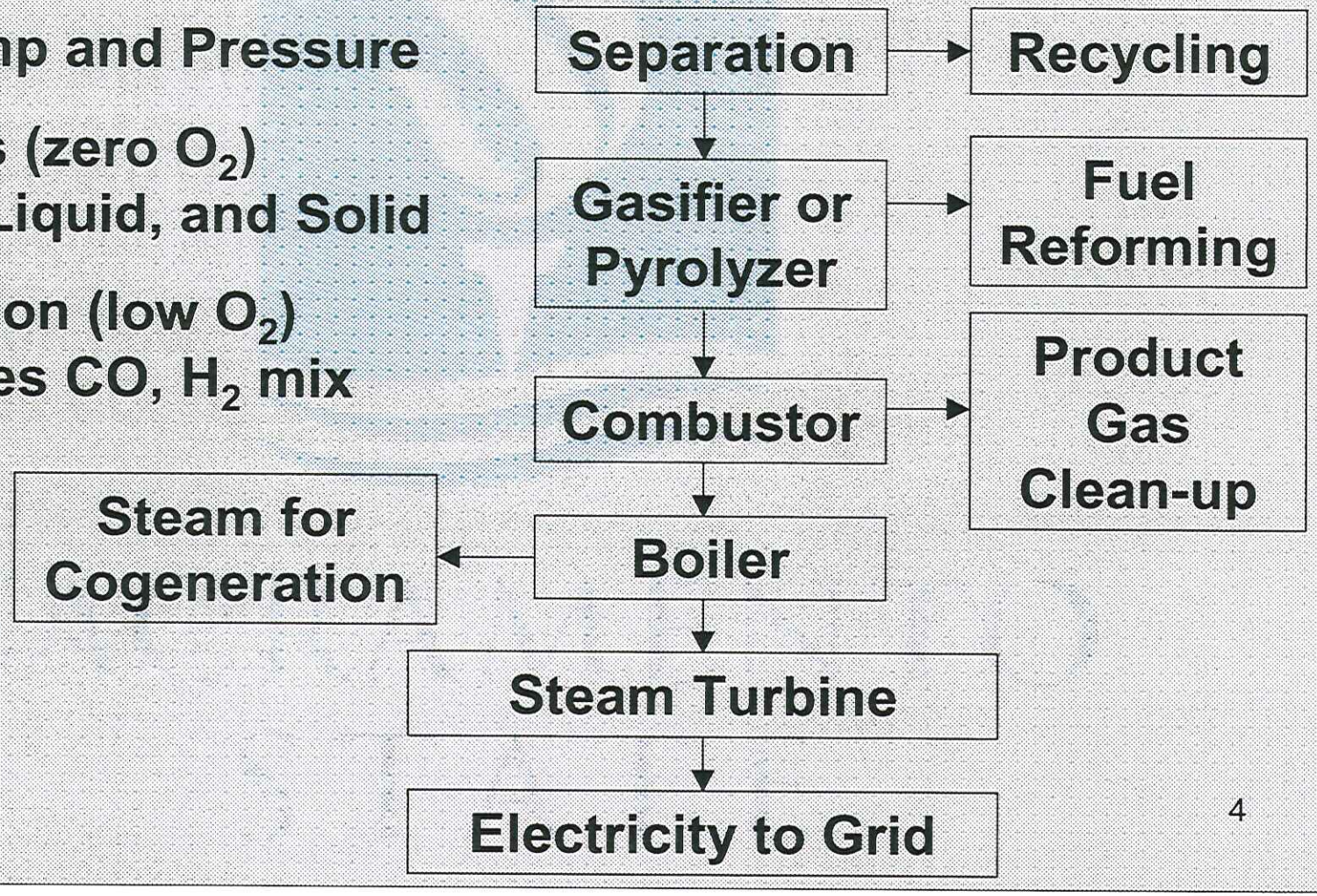
Disadvantages

- Gaseous Pollutant Emissions
- Ash Disposal (Heavy Metals)
- Promote Waste

WTE Pathways and Technologies

2. Gasification or Pyrolysis

- High Temp and Pressure
- Pyrolysis (zero O_2)
  - Gas, Liquid, and Solid
- Gasification (low O_2)
  - Creates CO, H_2 mix



WTE Pathways and Technologies

2. Gasification or Pyrolysis

Advantages

- Low pollutant emissions
- High flexibility (syngas use)

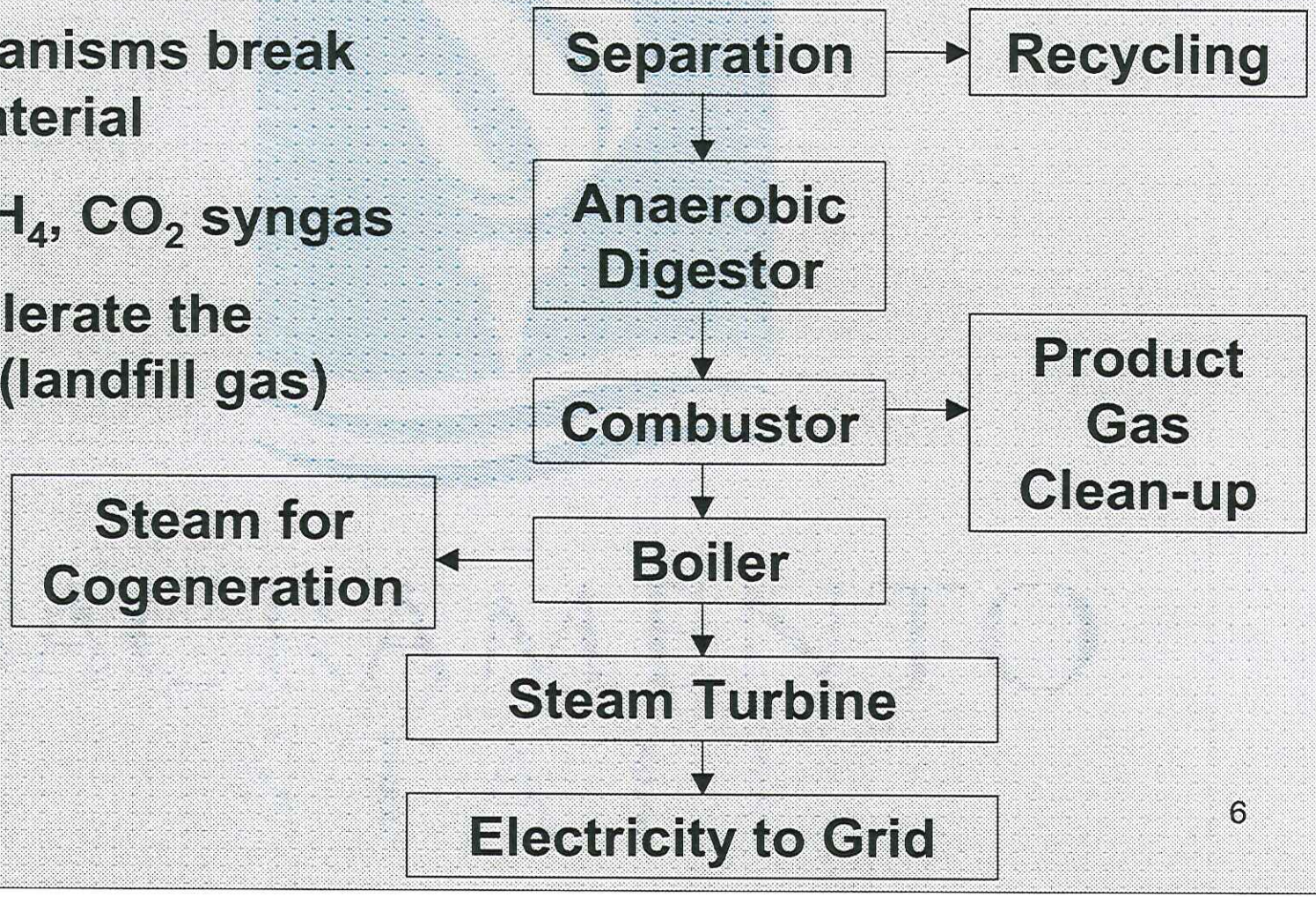
Disadvantages

- Tar production
- Immature technology
- Preprocessing, energy requirement

WTE Pathways and Technologies

3. Anaerobic Digestion

- Microorganisms break down material
- Create CH_4, CO_2 syngas
- Can accelerate the process (landfill gas)



WTE Pathways and Technologies

3. Anaerobic Digestion

Advantages

- Low pollutant emissions
- Low energy "cost"

Disadvantages

- Time, space required
- Initial and operational costs
- Multiple products (residues, sludge, compost)

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Comments/Feedback on RFQ

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Direct Incineration Partners

1. Covanta
   - Advanced NOx, Ash systems
   - Successful, proven facilities
   - Site Visits Possible

2. Urbaser
   - Mostly direct incineration, some AD
   - Many facilities in Europe, none in US

3. DESC-WSRI
   - Distributed systems to reduce transport

Comments/Feedback on RFQ

Gasification/Pyrolysis Partners

1. BLT/WWT

- Experience with recycling/separation
- No experience with gasification/electricity
- Want to partner with SMUD and/or Aerojet
- All MSW must go to this sorting facility?
- Pimentel – Controversial studies on ethanol (claim energy ratio < 1.0)

2. Envirepel

- Modular gasification/combustion system
- Little evidence other than Vista, CA

Comments/Feedback on RFQ

Gasification/Pyrolysis Partners

3. International Environmental Solutions (IES)
   - Continuous feed pyrolysis process
   - Produce gas and solid (10% vol. reduction)
   - No experience/partners for electricity generation, Aerojet site?

4. US Science and Technology
   - Plasma Arc Gasification (PAG) process
   - Produce high quality syngas, metal dust
   - Large energy consumption
   - Propose carbon capture/sequestration

Comments/Feedback on RFQ

Anaerobic Digestion Partners

1. FirmGreen
   - Work with existing landfills?
   - Clean/Upgrade landfill gas to higher value fuels

Other Partners

1. Zanker
   - Propose multi-product model with electricity and lubricants
   - Experience of ZeroWaste Energy Co. is not clear. Pyrolysis technology?

Comments/Feedback on RFQ

Other Partners

2. Recycled Refuse International
   - Steam autoclave and advanced separation
   - Claim 90-98% of waste stream recycled
   - No need to separate at source

3. Aerojet
   - Properly zoned land available
   - Electricity purchase and cogeneration agreements possible
   - City's relationship to county landfill?

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Recommendations

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1. Independent Studies Needed

- Cost-benefit, risk, life cycle analysis
- Clearly defining City's objective
- Technology, location selection critical

2. Suggested Partners

- 10 of 11 responders have valuable expertise
- FirmGreen's landfill gas cleanup and upgrade technology does not seem relevant to project

3. Visit nearby MSW WtE facilities