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Energy & Environment

Session C: Drivers and barriers for development of Waste to Energy

Health and social impacts

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Overview

1. Can waste to energy processes have an effect on health?
   - Key factors which influence effects on health
2. Can health impacts be managed?
   - Regulatory framework
   - Design and operation
3. Social impacts

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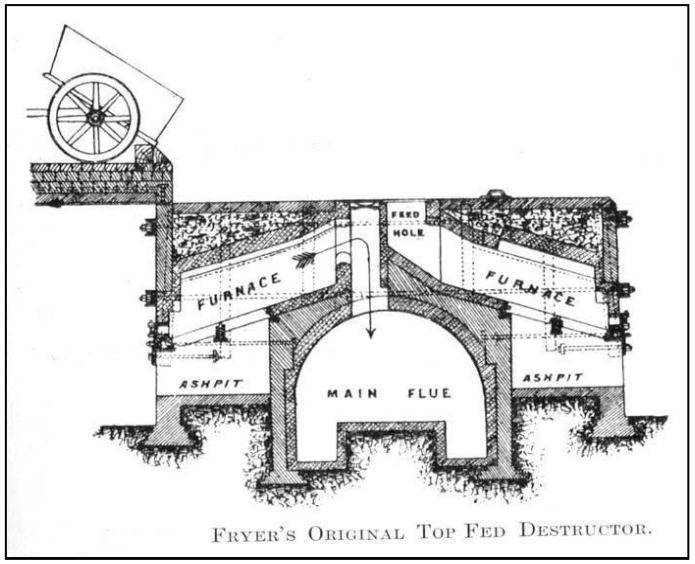
Public perception is strongly influenced by past performance

- Waste to energy has been used for a long time
  - Manchester, UK 1876



FRYER'S ORIGINAL TOP FED DESTRUCTOR.

  - Cambridge, UK 1894

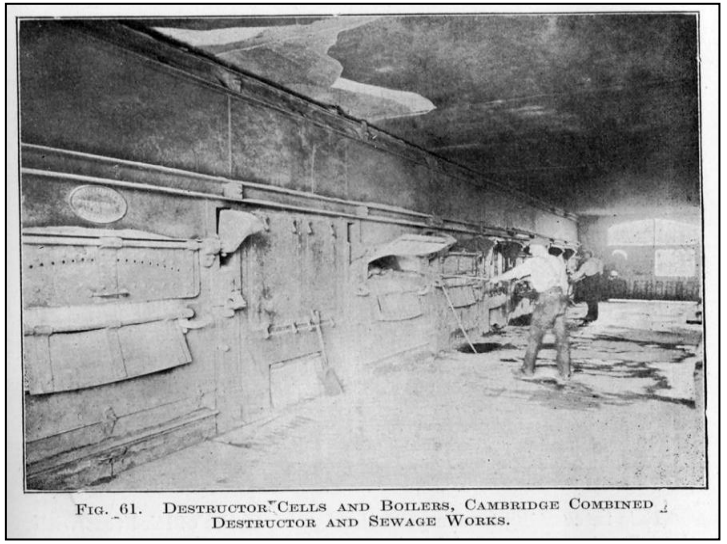


FIG. 61. DESTRUCTOR CELLS AND BOILERS, CAMBRIDGE COMBINED DESTRUCTOR AND SEWAGE WORKS.

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Can waste to energy affect health?

- WtE facilities designed and operated to current standards (e.g. Industrial Emissions Directive 2010/75/EU) have no significant or material effects on health
  - Scientific evidence does not allow us to say “no” effects
  - If there are any effects, they are too low to be detected
  - If there are any effects, they are insignificant compared to other commonly encountered health risks
- UK regulatory authority: “*There may have been an association between emissions ... in the past from ... waste incinerators and some forms of cancer ... the magnitude of any past health effects ... is likely to have been small ... any risk to the health of a local population living near an incinerator, associated with its emissions, should also now be lower.*”
- http://www.esauk.org/energy_recovery/EfW_Health_Review_January_2012_FINAL.pdf

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Can waste to energy affect health?

- Some research highlights apparent issues
  - E.g. Ashworth et al., "*Waste incineration and adverse birth and neonatal outcomes: a systematic review,*" 2014
  - E.g. Garcia-Perez et al., "*Cancer mortality in towns in the vicinity of incinerators and installations for the recovery or disposal of hazardous waste,*" 2013
  - E.g. Tango et al., "Risk of adverse reproductive outcomes associated with proximity to municipal solid waste incinerators with high dioxin emission levels in Japan" 2004
- There can be a detectable effect when facilities are not operated to modern standards
  - Challenging investigations: many studies not properly conducted
  - Where an effect is observed, always reflects operation below current standards
- E.g. Tango et al.
  - Studied "municipal solid waste incinerators with high dioxin emission levels (above 80 ng ITEQ/m^3)"
  - Cf. EU limit of 0.1 ng ITEQ/m^3
- There can be a detectable effect on public health when facilities are not operated to modern standards
  - Past processes, no longer operating
  - Persistent poor performance
  - Regulation and enforcement not strong enough

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Can health impacts be managed?

- Experience shows that health impacts can be controlled to undetectable and insignificant levels.
  - Appropriate **planning framework** is important
    - Process location; sizing; public involvement in decision-making processes
  - Requires a high standard of **process design**
    - To enable emissions limits and environmental standards to be achieved
    - Significant cost to project associated with environmental compliance
  - Requires ongoing good **operation and maintenance** standards
  - Requires robust **regulation**
    - Ensure that performance standards are maintained
    - Take action to address failures
  - Effective **communication and engagement** with the public is important

Protest against a proposed WtE facility

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Public perceptions of health impacts

- Public engagement across the range of resource management and waste issues is important
  - People take responsibility for their waste
  - People understand how their waste is dealt with
- Concerns remain about health impacts
  - Past performance affects current perceptions
  - Many people have a general fear, but do not understand the issues
  - Some people have specific, difficult questions
  - Fears about health impacts contribute to public protests against existing and new waste to energy development
  - The right measures allow concerns to be answered
  - E.g. "*Worried about heavy metals? The concentration of mercury in incinerator emissions is less than the concentration in a tin of tuna fish. We know it's important to keep working to avoid emissions of metals, and incinerator emissions are now so low that they don't have any detectable effects on health or the environment.*"

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Public perceptions of health impacts

- People remain concerned about some key issues
- Fine particles
  - All combustion processes emit nanoparticles. Emissions from WtE facilities are filtered so normally an insignificant contributor (e.g. < 0.1% of UK emissions)
  - Main sources likely to include: traffic, domestic wood burning, natural sources
  - Slight contribution from EfW to local public exposure can normally be shown to be insignificant
- Dioxins and furans
  - Control of dioxins and furans is now well understood
  - Controls must be built in to facility design and operation, and properly enforced
  - The impact of dioxins and furans on health can normally be demonstrated to be insignificant
- Carcinogens and cancer risk
  - Published research shows no detectable impact of facilities operated to current standards
  - Perception affected by research at older sites and problem sites
- Local issues may occur if location, design, operation, regulation are unsatisfactory
  - Health effects cannot be ruled out
  - Investigation may include evaluation of population health alongside facility performance

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Social impacts

- Social impacts are likely to depend on local factors
  - In principle, no need for a WtE facility to have adverse social impacts
  - New ways of dealing with waste may affect livelihood of waste pickers
  - Traffic may require careful consideration
  - New WtE facility should not affect health, but…
  - New WtE facility may be perceived as affecting health
  - Likely to be benefits from improvements in waste management
    - E.g. reduced odour problems, scavengers (birds, rats) etc
    - E.g. employment opportunities
  - Public involvement and understanding in decision-making processes will help to mitigate real and perceived social impacts

Promoting jobs from construction of WtE facility, Scotland

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