Energy from waste:
Advanced Thermal Technologies

Planning implications

Presentation by:
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Advanced thermal treatment delivering:
Diversion from landfill
Renewable combined heat and power
Proximity principle / local solutions

Environmental impacts

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Lancaster Environment Centre

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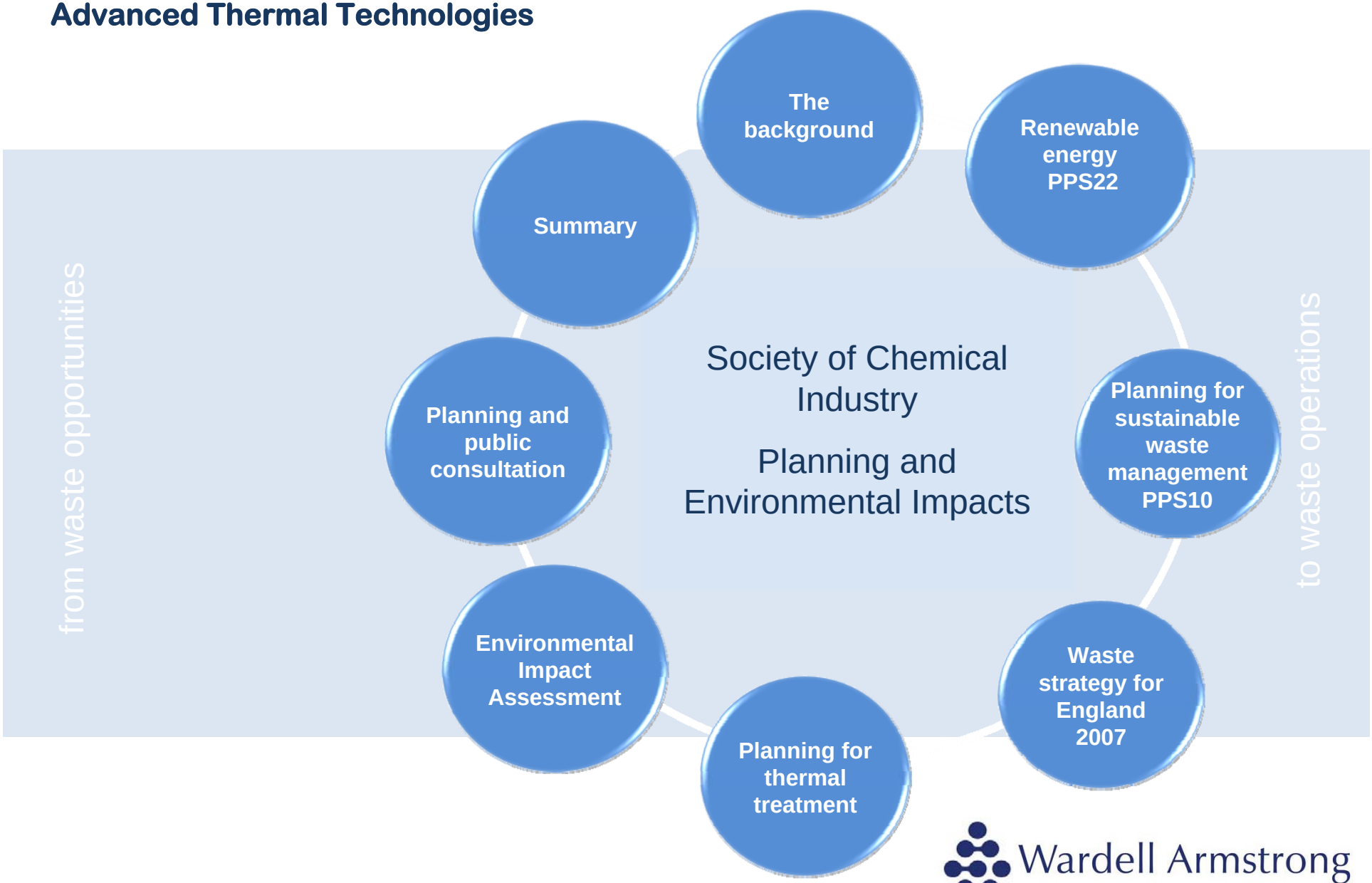
Energy from waste: Advanced Thermal Technologies



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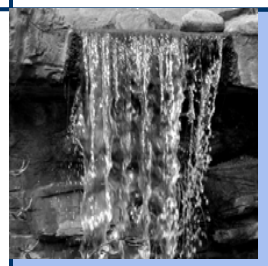
Renewable energy PPS22

National policy objectives



Key objectives in PPS22

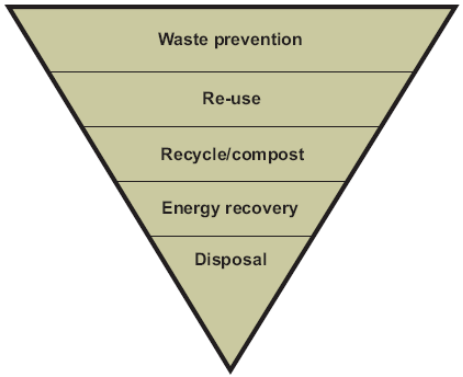
- 60% reduction in CO_2 emissions by 2050.
- Renewable resources include energy from biomass which includes organic wastes **BUT** excludes mass burn.
- Projects capable of being accommodated throughout England
- RSS and LDF – contain policies to promote and encourage
- Criteria assessing applications – should not constrain or rule out specific types of technology
- Acknowledge the wider benefits for renewable energy developments
- Planning decisions should not be influenced by assumptions relating to feasibility

National policy objectives

Planning for sustainable waste management PPS10

Key objectives in PPS10

- Sustainability – Waste Hierarchy
- Local delivery of suitable facilities
- Implement targets for diversion of waste from landfill
- Proximity of treatment facilities to waste arising
- Reflect the concerns and interests of communities
- Integrated design and layout



The Waste Hierarchy

National policy drivers

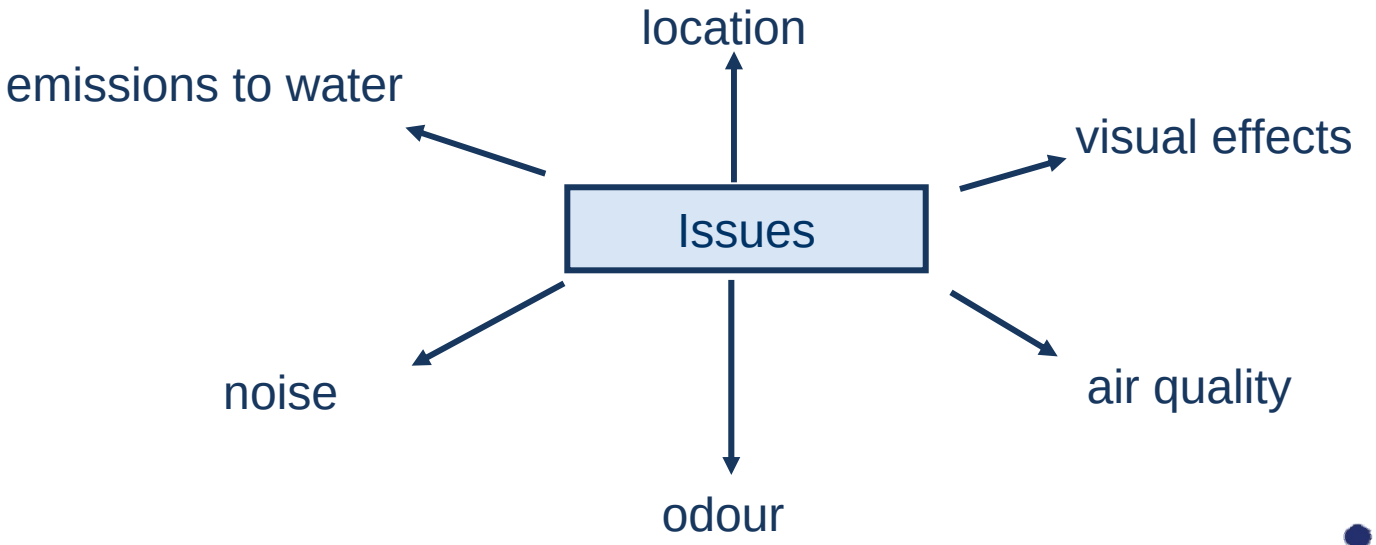
Key objectives in the Waste Strategy

- Savings of 9.3 M tonnes of CO_2e by 2030 compared to 2006
- EfW to treat 25% MSW by 2020 compared to 10% in 2007
- Waste wood energy market
- ROCs – specific support for pyrolysis and gasification
- Provision for all types of waste infrastructure
- Specific suitable sites identified in local frameworks

Key issues to consider in planning submissions

Planning for thermal treatment

- Waste source
- Technology
- Proximity principle and transportation
- Access
- Energy use and heat distribution



Planning for thermal treatment

Waste types and technologies

The potential for combined heat and power from organic waste / biomass

Wood	Uncontaminated – conventional technologies Contaminated – emission control
Food waste	Segregated – preferred route through AD Co-mingled with packaging
Residual biodegradable wastes	MRF – residual waste is co-mingled (rdf) MBT - autoclave, in vessel composting, AD (srf)
STW / industrial	Small scale – significant potential Specific waste streams
Agricultural	Significant potential – competes with AD

Note: mass burn incineration (and landfill) have not been considered for this analysis

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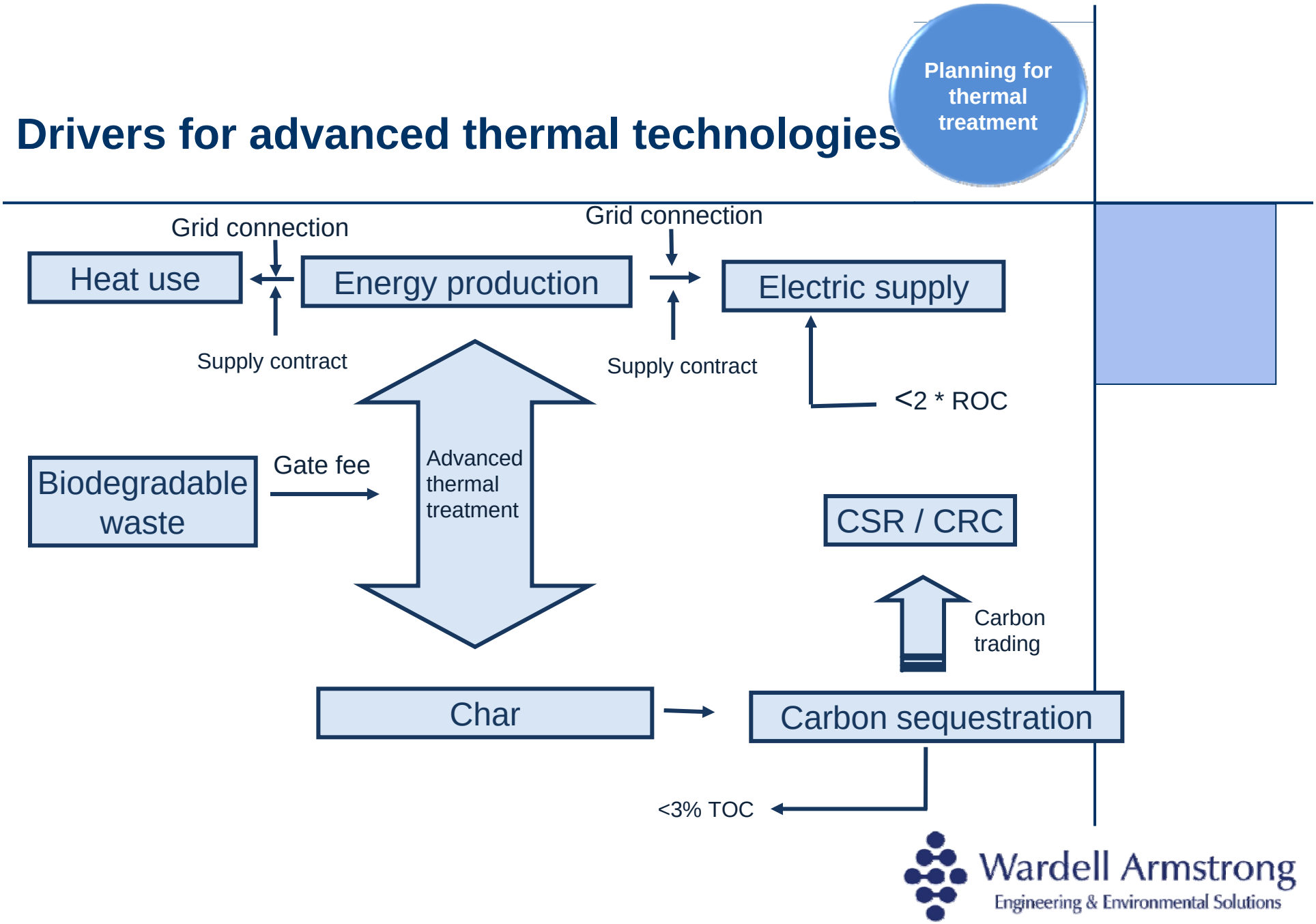
Planning for thermal treatment

Review of options

Technology	Benefits	Disbenefits
Aerobic digestion	Very simple process Outlet for products Cost effective Waste hierarchy	Contamination Greenhouse gases
Anaerobic digestion	Methane capture Simple process Versatile Valuable digestate	Contamination Biological process
Advanced thermal processes	Mixed waste Energy, fuels and chemicals Small to large scale	Largely unproven in UK Public acceptability

Drivers for advanced thermal technologies



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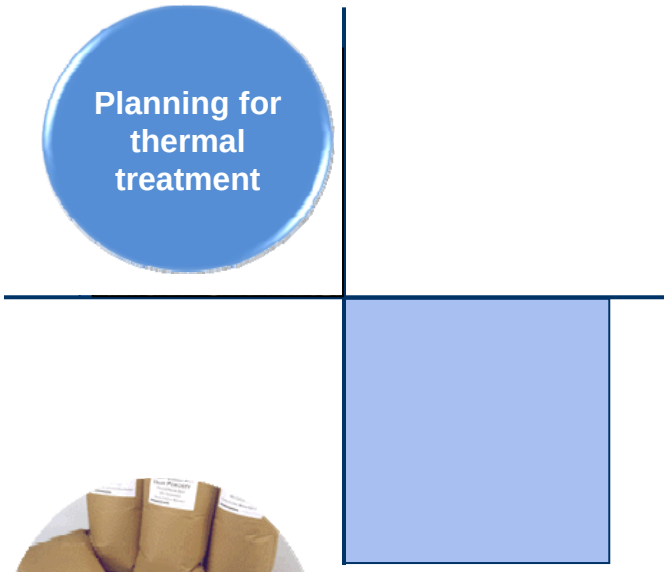
Potential routes using pyrolysis gasification

Power generation



Fine chemicals

Resins & adhesives

Biochar

Bio (transport) fuels

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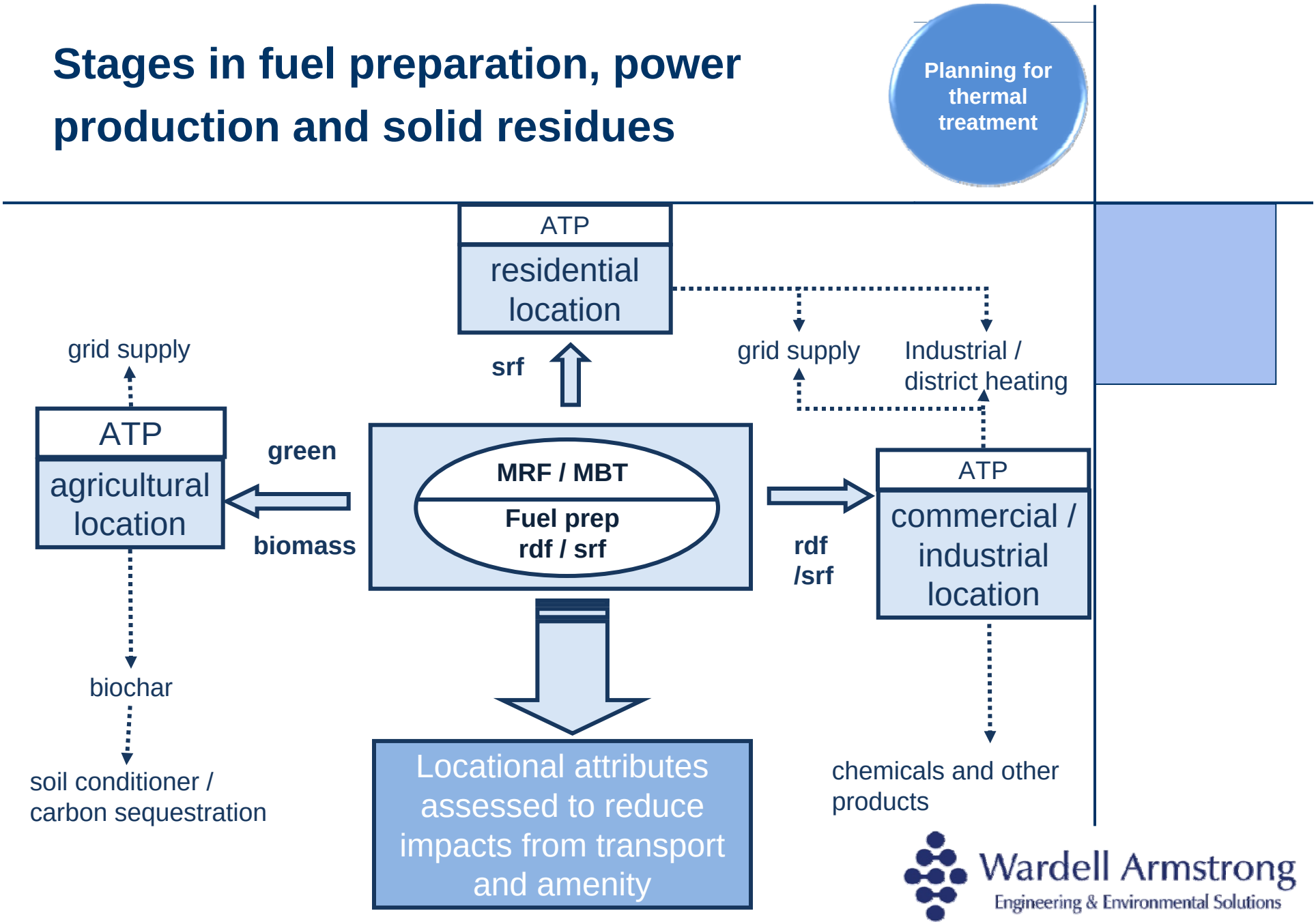
Stages in fuel preparation, power production and solid residues



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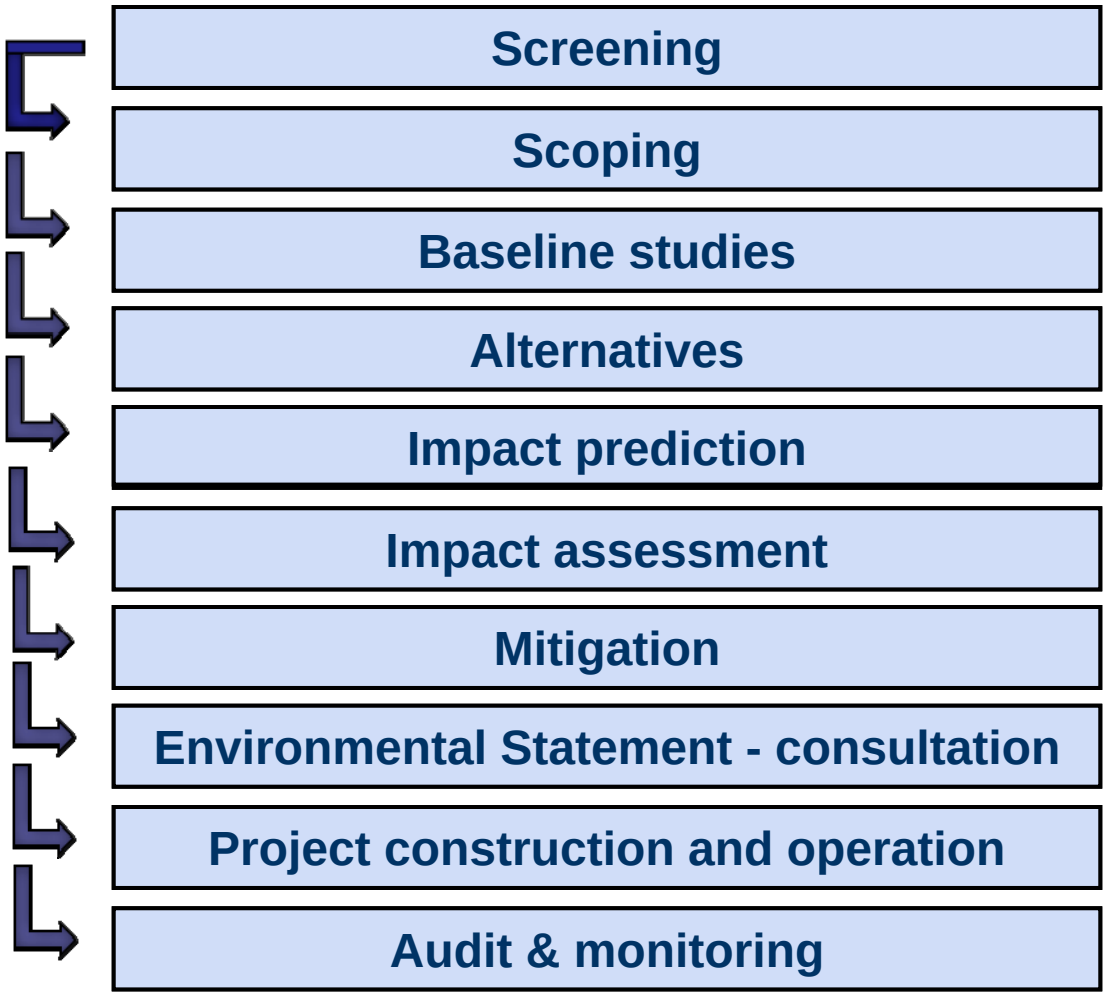
Environmental Impact Assessment

The EIA Process

- The EIA should identify, describe and assess the direct and indirect effects on the following factors:
  - human beings, fauna and flora
  - soil, water, air, climate and landscape
  - material assets and cultural heritage
  - the interaction between the above factors

Environmental Impact Assessment

The EIA Process



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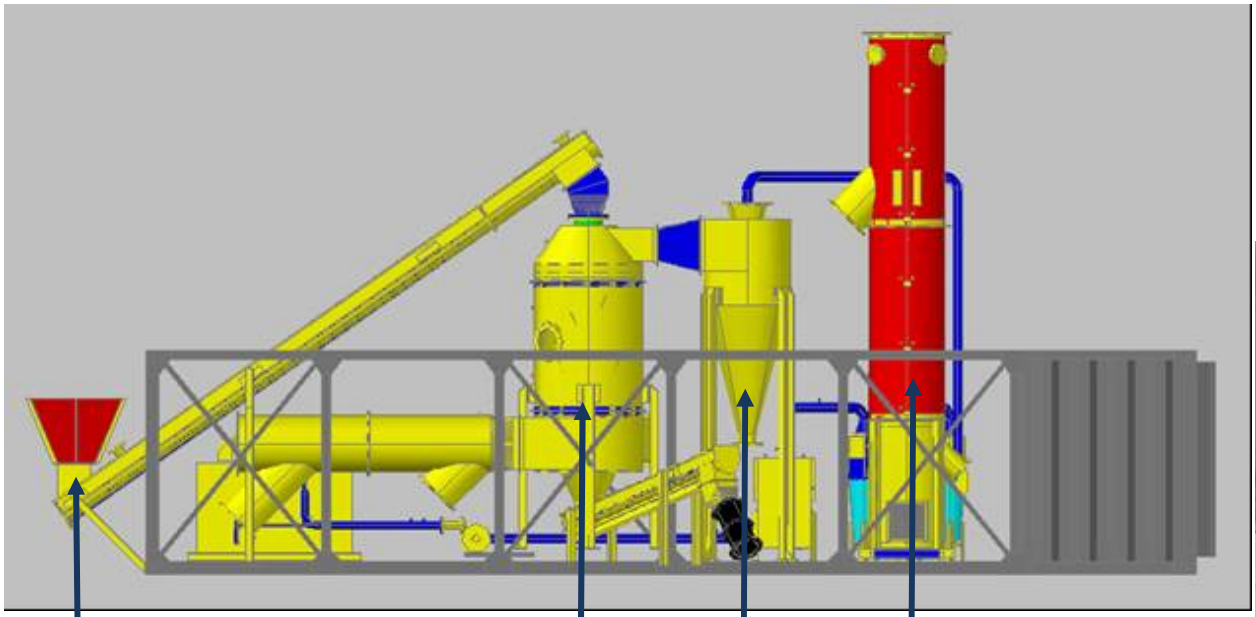
Environmental Impact Assessment

Define the technology



Prototype plant

Courtesy of Intervate Ltd

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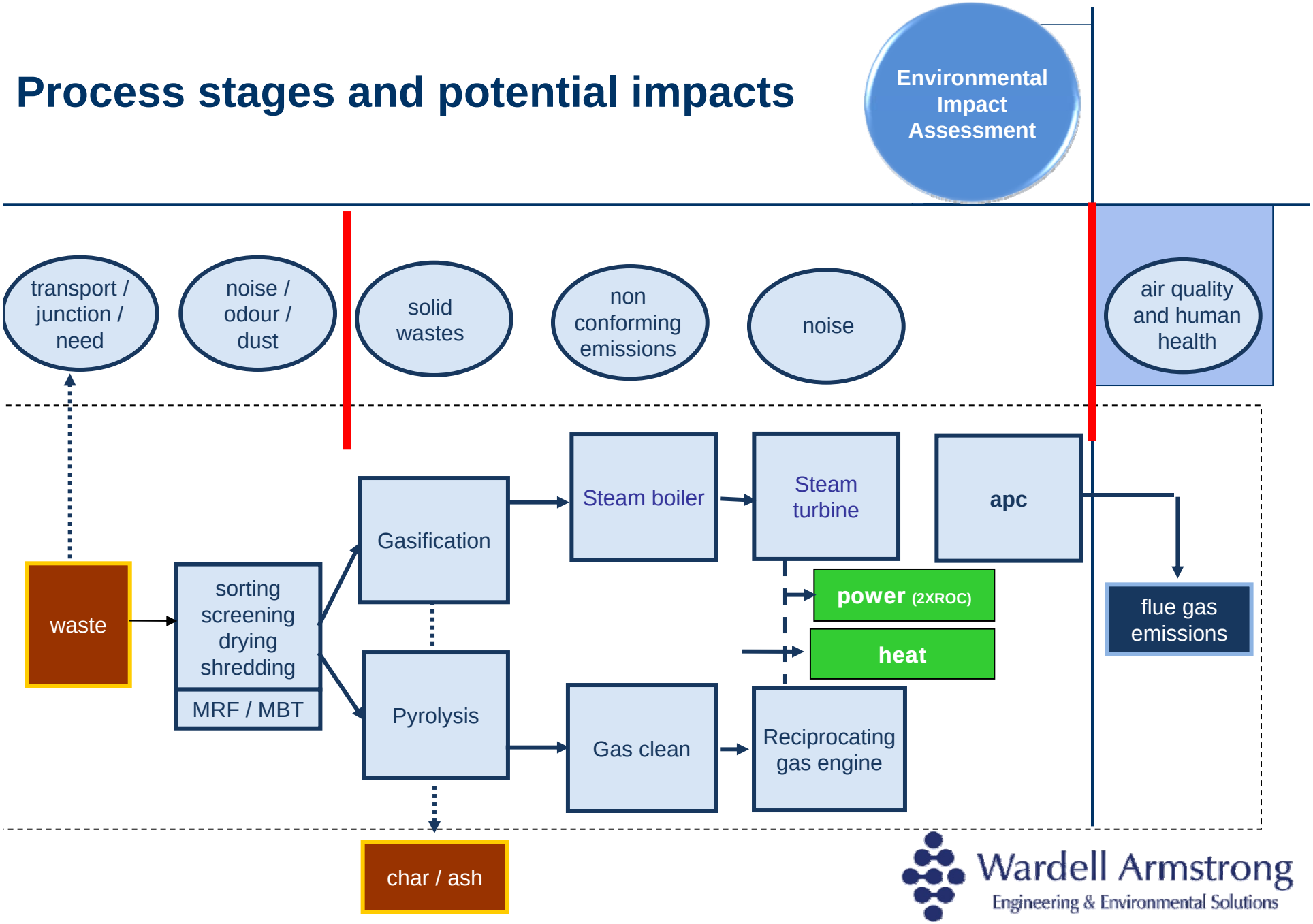
Process stages and potential impacts



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Environmental Impact Assessment

Flue gas emissions

mg/Nm^3 11% 02 @ 273K & 101.3kPa	EU Directive Limits		Pyrolysis & gasification (typical)
	s: spot /d:daily	½ hr	(spot)
Particulates	10 (d)	30	0.3
VOC's as carbon	10 (d)	20	Trace
NO (NO + NO_2)	200 (d)	400	<50
HCl	10 (d)	60	5
HF	1 (d)	4	<0.2
SO_2	50 (d)	200	< 2.0
CO	50 (d)	150	Trace
Cd & Ti	0.05 (s)		0.007
Mercury	0.05 (s)		0.005
Pb Cr Cu Mn Ni As Sb Co V Sn	0.5 (s)		0.006
Dioxins TEQ ng/Nm^3	0.1 (s)		<0.003

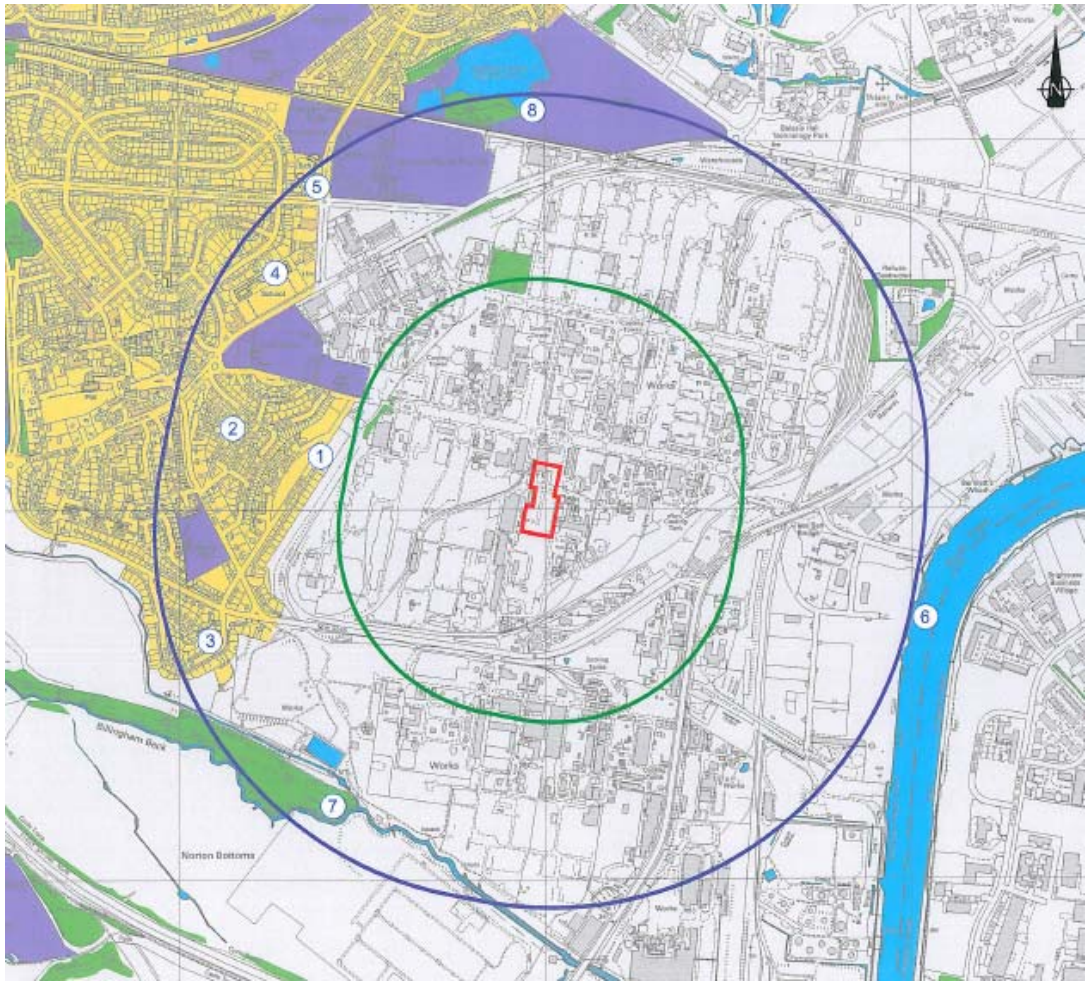
Environmental Impact Assessment

Defining project environmental impacts?

Level	Environmental issue	Factors
national	waste hierarchy	energy / carbon sequestration
	climate change	combined heat and power
	air quality	Natura 2000 sites
regional	landscape	character
	air quality	AQMZ / SSSI etc
	human health risk	density / distribution
	surface water	proximity to main river
local	transport	road network / access
	visual impact	prominence / surroundings
	noise	Presence of sensitive receptors
	amenity (odour / dust / pests)	
	contamination / cultural heritage / drainage	Site specific
	Socio economic	Employment / local economy

Environmental Impact Assessment

Defining project environmental impacts



Environmental Impact Assessment

Programming environmental studies

Period	Environmental issue	Sensitivity
March to September	Ecology	timing critical – species specific
Annual	Ambient air quality Surface and ground water	Published data sources
Defined periods	Transport Noise	Avoid holiday periods, define peak traffic hours and quietest hours for noise - potentially a night time period
Not time sensitive	Contaminated land, soil & drainage, cultural heritage, landscape and visual	Early knowledge of archaeology is essential. Visual impacts – clear winter day

SO – if the planning system is favourable AND the UK needs to divert biodegradable waste from landfill…..

- Why do advanced thermal treatment technologies have a poor public perception?
- Would other factors that act to increase climate change mitigation improve public perception?
- Does public consultation improve public perception of thermal treatment of waste?

Planning and Public Consultation

(A view)… of the public's view…

What are the key issues?

UK Without Incineration Network UK w|n

- Any form of incineration is wrong!
- Most pyrolysis and gasification technologies are unproven
- Disincentive for waste reduction / waste hierarchy
- Emissions to air – could be hazardous – increases GHG
- Traffic and transportation
- Forced through against strong public opposition

B.A.M.B. NETWORK BRISTOL AGAINST MASS BURN INCINERATION

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The importance of public consultation in the planning process

Planning and Public Consultation

only label as consultation - if it Genuinely Is

- timing
- fine balance
  - too early - sets hares running
  - too late – no confidence (design complete)
- early approach to politicians
- give clarity on opportunities for change (be transparent)

- exhibitions preferred – meetings dangerous
- simple and consistent messages
- attendance ?
  - Applicant
  - Local Authority
  - Local Member

exhibitions vs public meetings

Summary

- Positive planning policies – promoting the technology
- Potential for treatment of a range of organic waste
- Combined heat and power – but also range of high value products
- Integrated development -flexible approach depending on location
- EIA - issues include scaling, plant performance and integration
- Timing of studies – critical to programme
- Community consultation – essential to success

THANK YOU

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