

What can we do with waste?

How can London get more from its waste? David Taylor looks at energy, infrastructure and design issues for the sector in the age of localism to come

Waste – everyone is involved in creating it, but relatively few appreciate the industry behind dealing with it or the magnitude of the issue in London. Or, indeed, how the forthcoming Localism Bill will affect a sector seeking to plug a capacity gap by building more treatment plants across the capital. And just how can more energy be released from waste to underpin London's commitments to low carbon?

Part of the answer, heard a conference run by the NLA into new technologies and infrastructure in recovering energy from waste, is to first attend to something of an image problem for the sector.

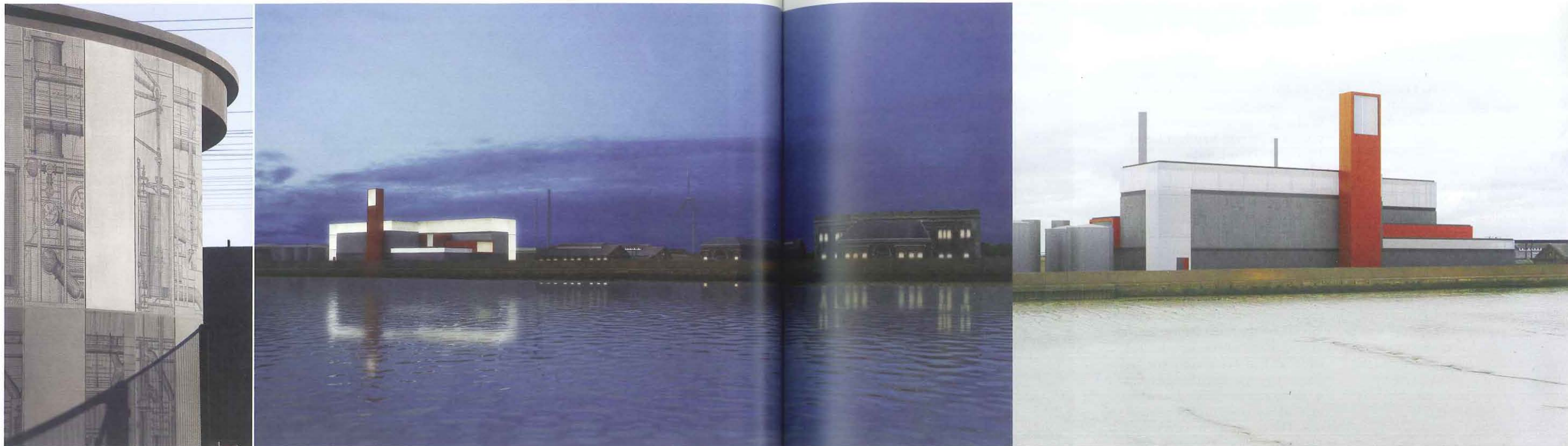
'People don't perceive waste positively', said Mark Bradbury, deputy director of development at the London Thames Gateway Development Corporation.

James Cleverly, chairman of the London Waste and Recycling Board, agrees, especially regarding the sensitive use of the word 'incineration', which for some time has been rejected by companies in favour of the euphemism 'energy from waste'. 'It sounds nicer, and positive, but that's only useful if the energy that you create doesn't then get dissipated into the atmosphere. What we're talking about is energy in a useable form, and that includes things like anaerobic digestion, as well as thermal treatments. So there is a bit of ground to cover winning back public support for energy from waste as a concept because it has been tainted by bad experiences people have had with incineration.'

Such attitudes may become more pointed as elements of Localism Bill pass into law, expected around April

2012. And things like clean air issues are another symptom the public associates with waste treatment issues, when in fact they are more likely to be associated with vehicle movements. Even these will be lessened if Cleverly reaches his goal of facilitating more, smaller facilities across London. Furthermore, perhaps to reduce the level of local opposition to schemes 'at the end of people's streets', he suggested, people need to talk less of the issues relating to the scheme and more of free electricity for a year for locals or other such incentives. 'That's a very different conversation.'

The board Cleverly heads, established under primary legislation, has a broad remit to promote and encourage the use of less waste. It projects a treatment capacity gap going forward but sees its role as



John Lyall Architects has demonstrated that not all infrastructure buildings need be ugly: Pudding Mill pumping station (above left) uses Bazalgette

drawings in its cladding. The Enhanced Digestion Plant at Thames Water's Crossness (above and left)

preventing that from materialising. From 2015 to 2031, the real growth in capacity is in a range of energy from waste technologies littered with acronyms: AD – Anaerobic Digestion; RDF – Refuse Derived Fuel; Thermal – another broad catch-all term covering everything from mass burn incineration through gasification; pyrolysis – anything that uses heat to dispose of it or shift its chemical make-up; and MRF – Materials Reclamation Facility – basically sorting and separating recyclable materials from residual waste.

London, said Cleverly, is a huge producer 'of everything' and contributes some 20 per cent of the UK's 'waste arisings'. 'That means that the potential fuel sources from energy to waste are bountiful', he added, and the board is looking at ways to make the city carbon positive

in terms of dealing with waste. Meanwhile, waste to energy also helps in energy security issues.

Traditionally, waste infrastructure has taken the form of large-scale incinerators. And although 'some people have a downer on mass burner incineration', it plays a part, as does landfill. It is an easy to understand, proven technology, albeit one which creates a municipal mindset and discourages a flexibility of approach. Another challenge is that precious few mass burner incinerators are well geared up for energy recovery. So part of the Board's solution is to attend to the financial models behind procuring these schemes, which traditionally have also lent themselves to big projects. 'We're trying to create a financial environment where it is a bit easier for the smaller tonnage, more localised, decentralised energy

from waste technologies other than incineration to also flourish. It is not a zero sum game.'

Indeed, both smaller and larger schemes are needed, said Stuart Hayward-Higham, development director for technology and markets for SITA UK. However, Hayward-Higham said one way of looking at it is that large industrial schemes of the magnitude of Belvedere, for example – the 600,000 tonne capacity plant being built in Bexley – could be seen as equivalent to six planning applications for six 100,000 tonne schemes, but consequently with six times less risk. Smaller community schemes need to be explained to the community so they understand why they are needed. Cleverly added that another financial model would help – he wants also to see more companies making more money from 'the back

door', selling recyclable material or energy produced from that waste.

In terms of London's government and the Mayor's strategy, Andrew Richmond, waste policy and programmes manager at the GLA said the aim was to produce a low carbon economy. Data from 2008 shows that London generates 80 per cent business waste (16 mtpa) and 20 per cent (4 mtpa) municipal waste. Municipal recycling forms around 25 per cent, energy recovery around 23 per cent, and almost half goes to landfill. In commercial and industrial, the performance on recycling was far better, at 42 per cent, but pretty much everything else went to landfill. Dealing with business waste costs an estimated £2 billion, so it is a 'massive market', said Richmond. But other particular challenges for London include its fast growing population,

rises in landfill taxes and the fact that most of the waste that does go to landfill travels out into the counties – and they don't want to deal with London's waste any more. The landfill sites that are in London will be closed by 2018 and those just outside are almost at capacity.

'Dealing with business waste costs an estimated £2 billion, so is a 'massive market'

The capacity gap is 1.8 mtpa in municipal, and that is assuming current infrastructure projects (including two PFI projects that have currently lost funding) go ahead; in commercial and industrial it is 6.6 mtpa. But one of the issues in recycling, said Richmond, is that some of the new technologies pull out

materials from recycling where there is no real market for them – one of the few 'diversions' the GLA is seeing is when poor quality paper is sometimes recycled to gain a few extra percentage points. This is partially why the GLA is instead setting a CO2 standard for London to aspire to, as well as to align it with the climate change mitigation strategy, which aims at a 60 per cent CO2 reduction by 2025. In order to achieve that goal, 25 per cent of the reduction should be achieved through decentralised energy, and waste could contribute half of that 25 per cent target. 'We've got to get away from the position where we're chasing our tails', said Richmond. 'We've got waste; we've got to get rid of it. We're not putting it in landfill; we need somewhere to get rid of it. Where's the easiest place to put it? Let's put it here. It's not very efficient, and we've

got to move away from that. We've got to plan better, make sure that all the opportunities are taken and this proposed policy is one way of helping us to achieve that.'

London Underground is London's biggest energy user: 1.1 terawatt hours/year, equivalent to what the city of Leeds uses. But even here, said climate change strategy manager for LUL Matthew Webb, major efforts are being made to procure locally generated renewable energy. With some 3.5 million journeys made on the Underground each day, the 'carbon challenge' is considerable, and growing. So the company is seeking partnerships with companies to deliver more renewable and low carbon energy into the Underground and reduce energy in its assets – with new lightweight, less energy intensive trains coming in, for example, and the installation of photovoltaic cells on station and depot roofs, plus biomass boilers and CHP plants.

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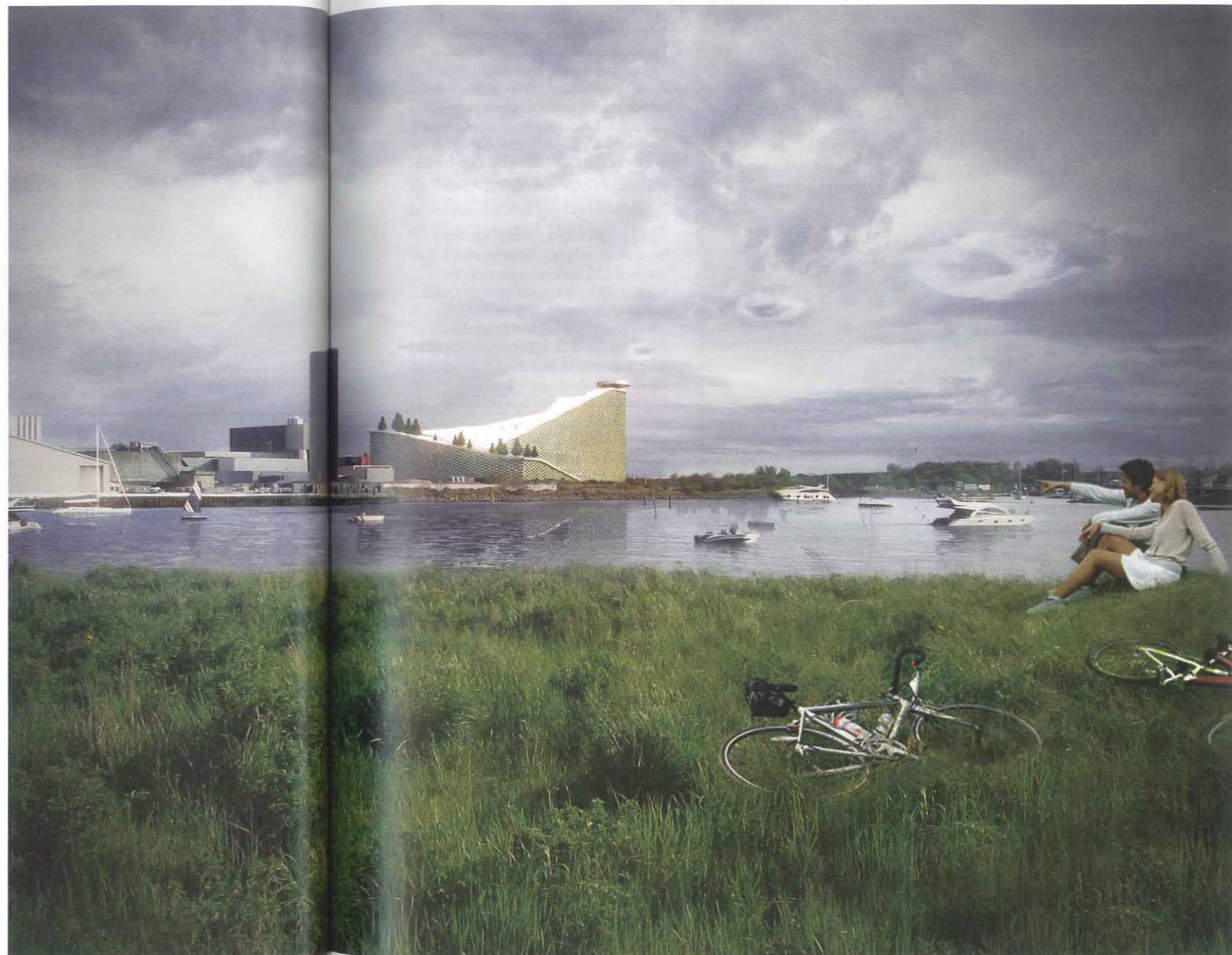
So what of localism? Hands up who wants a waste facility at the bottom of their road? And will the Localism Bill mean communities can fight such facilities that much more easily?

Cleverly believes that no scheme the size of Belvedere will be built ever again. And Mark Challis, partner at Bircham Dyson Bell, says that after the Localism Bill, for certain types of planning applications, much more sophisticated consultations will need to have taken place. The likely thresholds for this scenario, he said, are anything over 200 houses, anything over two hectares and anything that includes 10,000 sqm of new floorspace. The words 'energy' and 'waste' are not mentioned at all in the new Localism Bill. But those

developers concerned with providing infrastructure who felt that the old regional strategies, axed by Eric Pickles, were unhelpful because of the targets they contained, might be consoled. Now they can expect much more co-operation at a sub-regional level with local authorities and new provision for non-statutory Local Enterprise Partnerships.

In terms of power passing to neighbourhoods, certain people will try to use Neighbourhood Development Plans to stop development in their areas that they don't like, said Challis, but in reality these will be 'fairly constrained', he believes. For a start, they will have to take into account national policies and accord with strategic local plans. 'So I think the room for manoeuvre in these plans will be fairly limited, although that won't stop some people trying to stop development or promote a particular development they'd like to see.' Another obstacle is cost. The government estimates that such plans will cost anything from £17,000 to £63,000 to put into place, 'quite a chunk of money for some residents to face'. The Community Infrastructure Levy survived and could be like compensation for a community; referendums (on 'local' matters only) are mentioned heavily in the new legislation, although they are 'a bit toothless' – the local authority is not obliged to act on the results of any they hold. Mayoral Development Corporations in the Bill, however, do have planning and land acquisition powers – and it remains to be seen how many are created when the provisions become law in around April 2012, beyond the first one designated by the Mayor at the Olympic Park.

Another spectre from the Bill, added director of procurement for the North London Waste Authority Tim Judson, is of the prospect of fines from the EU to local authorities if they fail to deliver 2020 landfill directives, which could perhaps be of the order



Architect BIG has won a competition for a waste to energy scheme incorporating a ski slope in Copenhagen, Denmark

Fuelling change -**By Stuart Hayward-Higham,
SITA UK**

As a recycling and waste management company in the UK, we are always striving to find new cost effective and innovative ways in which we can help turn our customers' waste into resource.

We are therefore excited about the deal we have signed that will allow us to produce millions of litres of diesel fuel from waste plastic that cannot be usefully recycled.

Our partnership with technology firm Cynar Plc will enable the construction of Britain's first fully operational plants to convert this 'end of life' plastic into diesel and other fuels. Ten plants are proposed to be developed around the country that will be able to convert around 60,000 tonnes of plastic that is currently sent to landfill or energy-from-waste facilities to around 57 million litres of fuel.

The first facility is expected to be commissioned in London by the end of 2011 and, like the other nine plants in the pipeline, is expected to transform around 6,000 tonnes of plastic into around four million litres of diesel each year.

The waste plastic recovery process is expected to be competitive with normal diesel and the fuel itself is to have a lower carbon footprint than conventional diesel. The fuel qualities of the ELP diesel will be on a par with conventional diesel, without the need for any further refining and it is therefore suitable for commercial use.

This agreement with Cynar will thus provide a commercial solution to the environmental challenge of treating waste plastic that cannot be recycled. Traditionally, mixed waste plastic has been sent to landfill as no economically viable alternative way of treating it has been

developed. Our deal with Cynar means that this material can now be given a second life as a sustainable alternative to diesel.

Together with our parent company Suez Environnement, we will be investing millions of pounds into these new facilities, demonstrating our commitment to developing new ways to re-use and recover energy from waste that would otherwise be discarded.

Our partners Cynar are looking forward to the prospect of seeing their technology becoming both a manufacturing and mainstream reality and a market first, thanks to this agreement. Together, we are aiming to ensure that years of research will be realised in the near future with vehicles running on plastic-derived diesel, and ensuring that there is a practical, commercial benefit derived from dealing with Britain's growing mixed waste plastic mountain.

Producing diesel fuel from waste plastic is another example of how we are engaging with the circular economy, feeding waste back into the cycle as a resource that replaces the need to use precious natural resources. We continue to work towards our vision of living in a society where there is no more waste and look forward to seeing the first vehicles being powered by waste plastic hitting the roads soon.



of £250,000. This is not a situation Judson foresees in the seven north London boroughs he represents. Judson is procuring a long-term waste disposal solution currently; one which avoids the kind of damage to council tax bills which can result when waste decisions are made incorrectly. 'You're at risk of putting council tax up by 10 per cent in some London boroughs solely if you get waste disposal wrong', he said.

North London's process has not been plain sailing – what started out as a PFI process, securing the highest PFI credits for infrastructure in March last year, was reviewed when the new coalition government came in. A green light ensued, but the spending review switched it to red and meant that the finance was withdrawn. However, it remains live, with five bids on the waste side, five on fuel, and the authority is seeing solutions linked to industrial and commercial use of energy, carbon solutions and good delivery prospects. 'To us, energy is not just a matter of energy supply, it's £500m or so of guaranteed income', he said.

To the east of the capital, Bradbury said ad hoc policies for dealing with waste, as exemplified by strategies for commercial and industrial waste, do not work because it works as a hierarchy with a need for its various processes to be connected. Instead, part of a solution for dealing with waste in the capital might borrow from work Bradbury is involved with in the Sustainable Industries Park – 20 square miles of east London in the Lea Valley stretching through Beckton and on into Barking. Recognised by the Mayor as a growth area, it is key to London's future energy and waste strategy, but it is an area where the local authorities are keen to ensure that they are not seen as the capital's dumping ground. 'We want to develop an exemplar, starting between synergies and symbioses between various processes', said Bradbury.

LTGDC simplified the planning process, resulting in a decision in 14 weeks on the waste plant, and a decision in 12 weeks on infrastructure – and no objections. And having engaged with the Environment Agency from the outset, a permit was achieved inside four months.

Brebner: 'The public aren't going to accept a great big fuel burner on their doorstep. The times for that have passed'

The challenge of conventional plants in design terms is not inconsiderable. Austin-Smith:Lord partner Ian Brebner said that in London, all the normal issues – scale, proximity to communities etc – are often amplified by some of the other hoops in the journey such as CABE and architectural societies, for example. 'The Localism Bill will only make that worse', he said. 'In fact, London is a big problem because it takes an average of about two years to get a planning application through in London and it only takes one year in the regions. You add the Localism Bill and potentially that could stretch out even longer.'

At least some amendments to the Bill have sought to pave the way for a smoother journey for infrastructure projects, but the future will undoubtedly mean a reduction in scale of projects, making them more local and more focused on local needs, suggested Brebner.

For John Lyall, managing director of John Lyall Architects, adhering to a list of design principles here is crucial. Lyall feels it is important not to disguise waste or energy buildings, as his four modest infrastructure buildings at the Olympic Park – including Pudding Mill Lane pumping station near to the Bazalgette Greenway – bear testament to. The station, incidentally, was cheaper than a precedent scheme proposed by an

engineer. They must use good, tough, long-lasting materials, away from the normal Kingspan and Kalzip, the use of which Lyall feels only makes them look cheap. In this, the precedents in terms of the qualities inherent in the Victorian power stations or Bazalgette buildings are good ones, although where Bankside has had the good fortune to show its flexibility in re-use, Battersea Power Station, noted Bradbury, showed the opposite, having lain empty since 1983. They should also be timeless buildings, not fashionable. Lyall enjoys the engineering-led nature of infrastructure buildings, but believes they can also sometimes opt for a multi-building approach as 'an architectural composition' in a contemporary idiom rather than the all-too-common big box, or the 'armadillos' that normally result.

Self-generation and hybrid plants are just two of the new solutions coming forward more regularly. But ultimately, perhaps waste to energy has more of a fundamental conceptual or image problem. Hayward-Higham suggested that it was time to talk of waste as a

resource, or reuse: 'If you look at eBay, who thinks they're selling waste?' Essentially, it's the same thing, selling something you no longer have a use for to someone who does. 'We have to change our perception of waste.'

This may be at the heart of public opposition to physical projects 'in their back yards'. Brebner again: 'The public aren't going to accept a great big fuel burner on their doorstep. The times for that have passed.' In the end, it's an education process, too, on a large scale, he added. 'It's actually making this business an acceptable, productive industry that generates wealth, generates comfort and protects the environment. That's the big message that we have to start driving home now, because dealing with it in on an individual basis from the Localism Bill really is doomed to failure. Without it, the Localism Bill will shatter and fracture delivery for the next five to 10 years.' ■

The NLA conference 'Recovering Energy from Waste' was sponsored by SITA UK, Austin-Smith:Lord and Bircham Dyson Bell



The last of its kind? The under-construction Belvedere incinerator plant in Bexley