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Archwilydd Cyffredinol Cymru  
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# Procuring Residual and Food Waste Treatment Capacity



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This report has been prepared for presentation to the National Assembly under the Government of Wales Act 2006.

The Wales Audit Office study team comprised Jeremy Morgan, Emily Owen and Andy Phillips, under the direction of Matthew Mortlock

**Wales Audit Office  
24 Cathedral Road  
Cardiff  
CF11 9LJ**

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**Mae'r ddogfen hon hefyd ar gael yn Gymraeg.**

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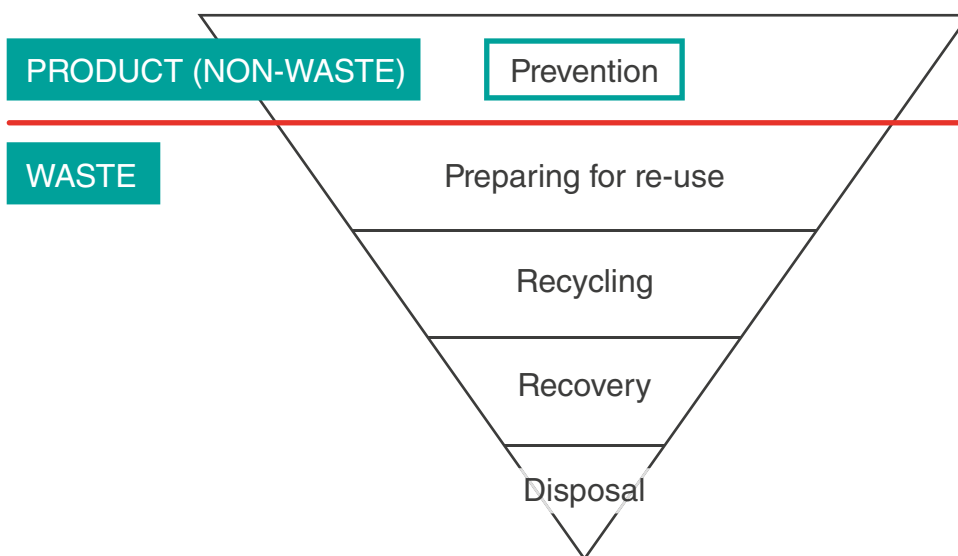
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# Summary report

## Summary

- 1 Waste management is an important and complex issue that covers a range of different but related approaches. The European Union Waste Hierarchy (Figure 1) reflects the principle that preventing the production of waste, or preparing waste for re-use, has much greater environmental benefit than recycling, which in turn has greater environmental benefits than other forms of recovery such as energy from waste. At the base of the hierarchy, with few environmental benefits, is disposal by means that recover no energy.

Figure 1 – The European Union Waste Hierarchy



Source: Directive 2008/98/EC on waste (Waste Framework Directive)<sup>1</sup>

<sup>1</sup> The first Waste Framework Directive [75/442/EEC] was amended in 1991 through Directive [91/692/EEC] and again in 2008 through the Waste Directive [2008/98/EC]. Separate to these Directives, the 'Landfill Directive' [1999/31/EC] regulates waste management of landfills in the European Union.

- 2 This report focuses on the provision of infrastructure for food waste recycling through anaerobic digestion and recovery through energy from waste. It forms one of a set of three related pieces of work on waste management in Wales that will be published by the Auditor General for Wales. The other two pieces of work have considered issues relating to waste prevention and municipal recycling.
- 3 The EU 'Landfill Directive'<sup>2</sup> places a statutory obligation on the UK to reduce the amount of biodegradable waste<sup>3</sup> sent to landfill. Landfilling waste poses environmental risks, particularly to climate change and to water quality (Figure 2). As an EU member state, if the UK does not achieve targets for reducing the amount of waste sent to landfill it is at risk of incurring significant fines.
- 4 In 2002-03, the Welsh Government determined that the best way to encourage the diversion of waste from landfill was to set challenging recycling targets. In 2004, the Welsh Government took further steps by introducing legislation limiting the amount of biodegradable waste that could be sent to landfill<sup>4</sup>. In 2008, the National Assembly for Wales' Members Research Service reported that if the trends evident at that time continued, 15 local authorities in Wales would fail to meet the 2012-13 Landfill Directive targets, resulting in fines of nearly £27 million<sup>5</sup>. Some councils did increase the amount of waste sent to landfill in the period to 2012-13 but at a rate that did not incur fines.
- 5 In June 2010, the Welsh Government published its strategy for waste management, **Towards Zero Waste, One Wales One Planet** (the strategy). The strategy and its supporting documents set out a plan for the sustainable management of waste resources to 2050. In order to meet its aspirations set out in the strategy, the Welsh Government determined that councils could not continue the practice of landfilling most of their food and residual waste (often termed 'black bag' waste). However, this required a step-change in both service delivery and councils' approach to waste treatment and disposal.

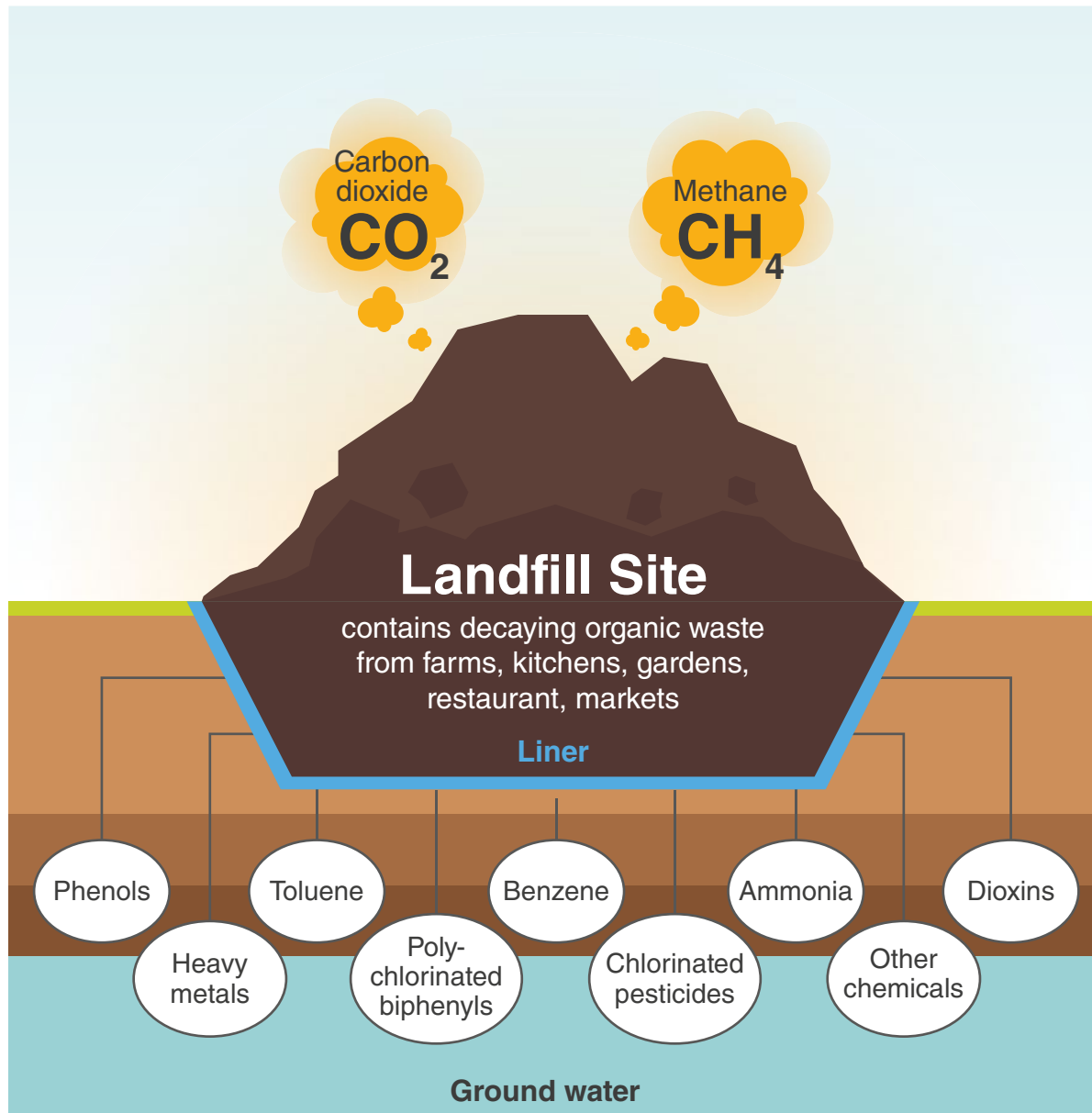
2 Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste.

3 Biodegradable waste includes any organic matter in waste which can be broken down into carbon dioxide, water, methane or simple organic molecules by micro-organisms and other living things using composting, aerobic digestion, anaerobic digestion or similar processes.

4 The Welsh Government introduced the Landfill Allowances Scheme (Wales) Regulations 2004 in response to the Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste.

5 National Assembly for Wales, Members' Research Service: **Topic Brief – waste management**, September 2008.

Figure 2 – The effects of landfilling waste





- 6 **Towards Zero Waste** suggested that councils make the step-change by sending residual waste to high efficiency ‘energy from waste’ treatment plants and food waste to anaerobic digestion plants. The Welsh Government’s aspiration for residual waste is that by 2050, enhanced actions on waste prevention and sustainable consumption and production will phase out the need to dispose of residual waste, and that 100% of waste produced will be reused or recycled. The Welsh Government plans to review **Towards Zero Waste** in 2018. In advance of that review, it has commissioned an evaluation of the statutory waste plan for Wales<sup>6</sup>, including economic benefits, against the **Well-Being of Future Generations (Wales) Act 2015**.
- 7 The Welsh Government determined that councils would benefit from financial, technical and legal support to enable them to make these significant changes in waste management practice. In 2008, the Welsh Government initiated the Waste Infrastructure Procurement Programme (the Programme) to assist councils in the procurement of long-term capacity for the treatment of residual and food waste (**Box 1**).

6 A suite of documents comprise the statutory waste management plan for Wales. It includes a number of sector plans and the Waste Prevention Programme.

## Box 1 – The Waste Infrastructure Procurement Programme

The Programme provided financial support for individual councils or partnerships to procure contracts for the long-term treatment of residual and food waste. There are ten projects within the Programme involving 19 councils. Three of the projects deal with residual waste and seven deal with food waste. The procurement phase of the programme concluded in March 2018 and projects have procured the necessary capacity for the treatment of their waste at facilities provided by the private sector. [Appendix 2](#) provides details of the individual projects, most of which involve more than one council.

The Welsh Government is providing on-going financial support to projects in the form of a fixed contribution towards gate fees throughout each project's operational phase. The Welsh Government's fixed contribution is based on 25% of the gate fees estimated in projects' final business cases, where it has not made a capital contribution (see below). Councils' contributions to the remainder of gate fees will depend ultimately on the amount of waste sent to a facility. Gate fees are payable from service commencement for a maximum period of 15 years for food waste projects and 25 years for residual waste projects.

Six of the ten projects were service contracts where the private sector provider built the facility at its own cost and risk. The remaining four projects (three food waste and one residual waste) included the construction of a facility, paid for in part by the local authority partners over the course of the contract as part of the gate fees. In those four cases the facility will revert to local authority ownership at the end of the contract. The Welsh Government provided capital contributions totalling £3.5 million for the three food waste projects.

For these four projects the Welsh Government has based its gate fee contribution on 15% of the total gate fees estimated in projects' final business cases for the three food waste projects and 25% for the North Wales residual waste project.

Nine of the contracts in the Programme are currently operating with waste being received by the relevant facilities. The facility to be used by the North Wales residual waste project is in construction and due to be fully operational in September/October 2019.

Early in the Programme, in 2010, there was a particular need to divert biodegradable municipal waste from landfill because several councils were near to exceeding their landfill allowances. As a result, the Welsh Government prioritised support for food waste projects over residual waste projects.

- 8 This report focuses on arrangements for procuring capacity for waste treatment through the Programme. It also describes arrangements made by councils outside the Programme, and the overall impact on the diversion of residual and food waste from landfill. The report does not consider the location and planning decisions on new waste management facilities. **Appendix 1** outlines our audit methods. We did not look in detail at the procurement of each project but focused on the overall management of the Programme.
- 9 **Overall, we found that the Welsh Government set up a well-managed programme to help councils procure capacity for food and residual waste treatment, but some risks remain. Several councils opted out of the Programme and have their own arrangements, but some still need to find alternatives to landfill for the longer term.**
- 10 The Welsh Government set out specific criteria that projects had to meet to secure funding support through the Programme, notably regarding the choice of technology. There was a clear and structured programme management approach and the Welsh Government made good use of specialist expertise. The Welsh Government encouraged partnerships between councils to improve value for money through economies of scale and attract more interest from the private sector, although there were difficulties in some cases. The Programme used a consistent and rigorous project management approach, which worked well generally despite some councils' limited experience of procuring waste infrastructure capacity.
- 11 The cost of the Programme is projected to be in the region of £1.4 billion to 2044-45. This is £850 million lower than suggested by initial estimates in projects' outline business cases but will depend on the amount of waste that needs treating. It is too early to judge the value-for-money of the contracts. The Welsh Government expects to contribute around £342 million to the projected £1.4 billion costs, making waste treatment capacity more affordable for councils. Risks remain for residual waste projects in particular and the projections used as the basis for these contracts do not align well with the Welsh Government's overall aspiration of zero residual waste by 2050<sup>7</sup>. Gate fee structures present certain financial risks for councils depending on the amount of residual waste treated. Projects have successfully transferred some other risks to the private sector, but these long-term contracts do not include break-clauses.

7 Projections for the three residual waste projects assume that councils will still need to treat significant volumes of residual waste beyond 2040.

- 12 Councils operating residual waste projects outside the programme are generally incurring higher costs, but median food waste treatment costs are similar to projects in the Programme. Although some councils are still reliant on landfill, the procurement of new waste treatment capacity has significantly reduced overall reliance on landfill across Wales in recent years.

## Recommendations

- 13 The 15-year contracts for the food waste projects will start coming to an end in 2027. We have not made any formal recommendations about planning for contractual arrangements beyond the lifetime of the current contracts. The average time from the Welsh Government's approval of the outline business case to operation for the seven operational food waste projects was four years. We would not expect any new contractual arrangements to take this long to plan. Nevertheless, partnerships will need to ensure that they have sufficient lead-in time for project development and decision-making on successor projects, including reviewing the benefits realised from the current projects.

### Recommendations

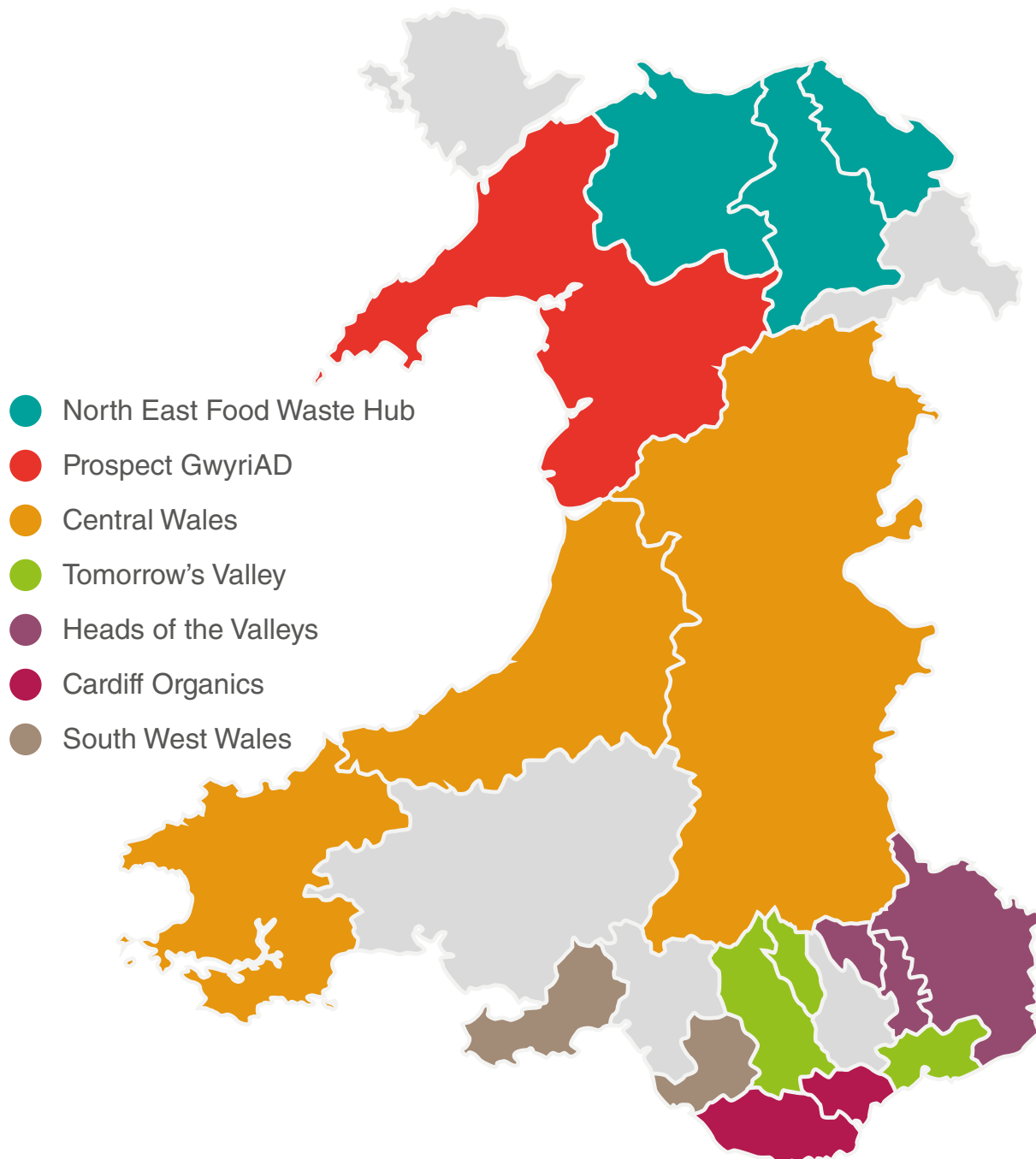
- R1 The projections for the three residual waste projects in the Programme assume that, across the 14 councils involved, the overall amount of residual waste will increase through the lifetime of the contracts. If these projections are accurate then something significant would have to occur beyond 2040 to reach zero waste across these council areas by 2050. If the projections are not accurate then there is the risk that councils will pay for capacity they do not need. **We recommend that the Welsh Government:**
- **in reviewing the Towards Zero Waste strategy, considers how its ambition of there being no residual waste by 2050 aligns with current projections for residual waste treatment; and**
  - **works with councils to consider the impact of changes in projections on the likely cost of residual waste projects and any mitigating action needed to manage these costs.**

## Recommendations

R2 The Welsh Government's programme support to date has mainly focused on project development and procurement. Now that most of the projects are operational, the focus has shifted to contract management. **We recommend that the Welsh Government continue its oversight of projects during the operational phase by:**

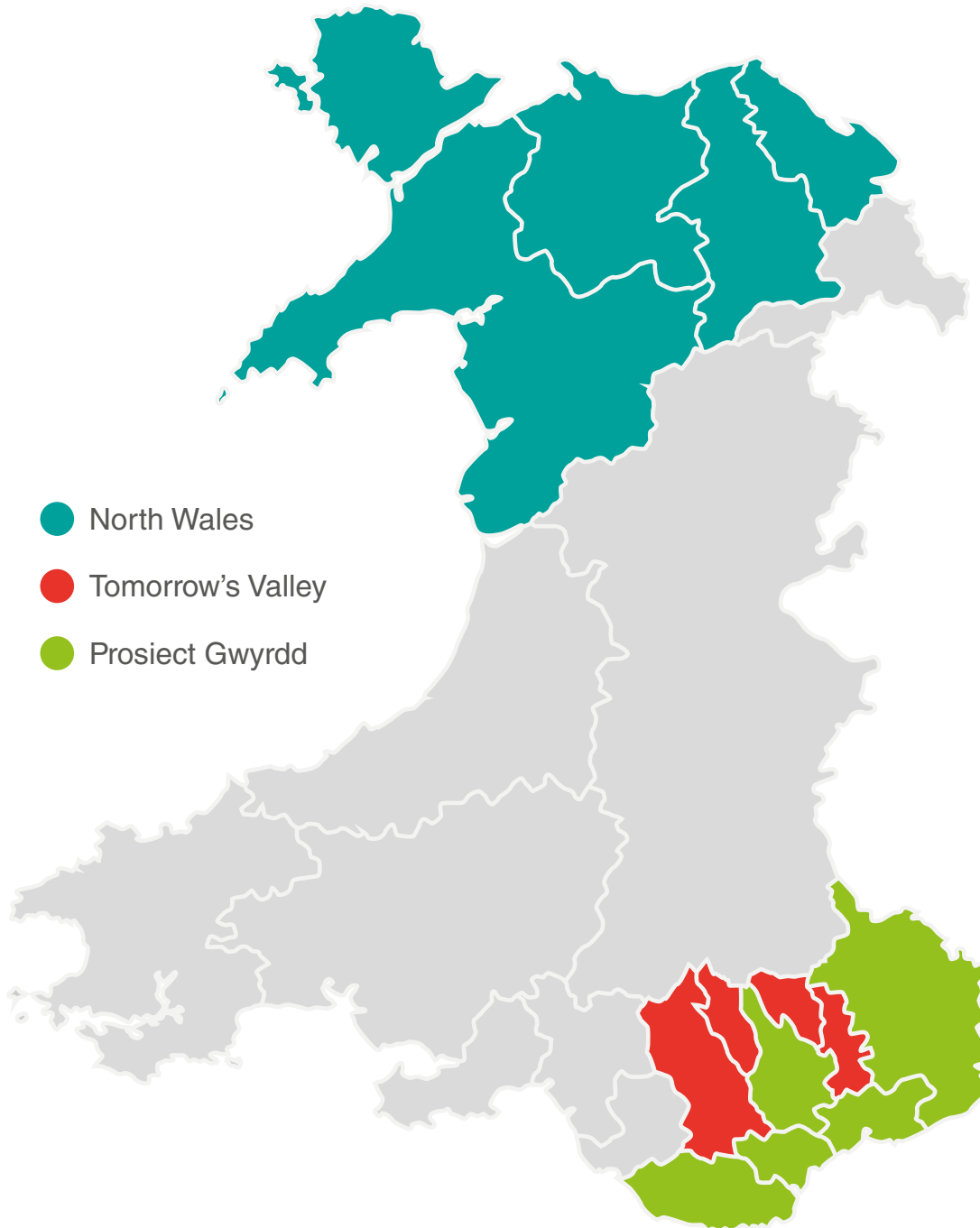
- **building on its existing model of providing experienced individuals to assist with project development and procurement and making sure input is available to assist with contract management if required;**
- **setting out its expectations of councils regarding contract management;**
- **ensuring partnerships revisit their waste projections and associated risks periodically, for example to reflect updated population projections or economic forecasts; and**
- **obtaining from partnerships basic management information on gate fees paid, amount of waste sent to facilities and quality of contractor service.**

Figure 3 – food waste treatment partnerships



Source: Welsh Government

Figure 4 – residual waste treatment partnerships



Source: Welsh Government

## Part 1

The Welsh Government set up a well-managed programme to help councils procure capacity for food and residual waste treatment, but some risks remain





- 1.1 This part of the report examines how projects in the Programme were developed and procured. It also considers projects' estimated lifetime costs and some of the risks in procuring long-term contracts in the context of uncertain projections on the amount of waste generated.

## To gain the Welsh Government's support, projects had to fulfil certain criteria including choice of technology

- 1.2 To gain Welsh Government support as part of the Programme, projects had to fulfil the following criteria:
- a the technical solution had to align with the Welsh Government's requirements for the treatment by processing of food or residual waste;
  - b to align with the Welsh Government's waste policy of maximising recycling;
  - c to demonstrate that project teams had the required capability and capacity to procure and manage the projects; and
  - d to develop a risk management strategy aiming to transfer risk to the party most suitable to manage it.
- 1.3 The choice of technology was particularly important. As outlined in **Towards Zero Waste**, the Welsh Government recommended that food waste projects utilise anaerobic digestion technology (Figure 5). For projects supported through the Programme, these anaerobic digestion plants must produce renewable energy/fuels and a high quality digestate<sup>8</sup> to PAS110 standard<sup>9</sup> that can be used as a soil improver or fertiliser.

<sup>8</sup> Digestate is a nutrient-rich substance produced by anaerobic digestion that can be used as a fertiliser.

<sup>9</sup> The British Standards Institute PAS100 standard is a specification against which producers can verify that digestates are of consistent quality and fit for purpose.

1.4 Residual waste projects are required to use high-energy-efficient technology classified to the EU's R1 standard (Figure 6). This means the facility must be classified as 'energy recovery' rather than 'waste disposal'. The Welsh Government's requirement for PAS110 and R1 status for waste infrastructure projects supported by direct government funding is unique among UK governments<sup>10</sup>. The three residual waste projects elected to use energy-from-waste technology. Energy-from-waste technology is more suited to achieving R1 status than alternatives such as mechanical biological treatment<sup>11</sup> which provides an incomplete solution, producing further residual waste which requires treatment.

10 If facilities lose the required PAS 110 or R1 status, the Welsh Government has the right to withdraw funding until issues are resolved. Contracts include process for rectification.

11 A mechanical biological treatment system is a type of waste processing facility that combines a sorting facility with a form of biological treatment such as composting or anaerobic digestion.

Figure 5 – how anaerobic digestion works

**Anaerobic digestion** is a series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen. Although the process produces greenhouse gases, they are not released to the atmosphere. These gases are combusted to generate electricity and heat or processed into renewable natural gas and transportation fuels.

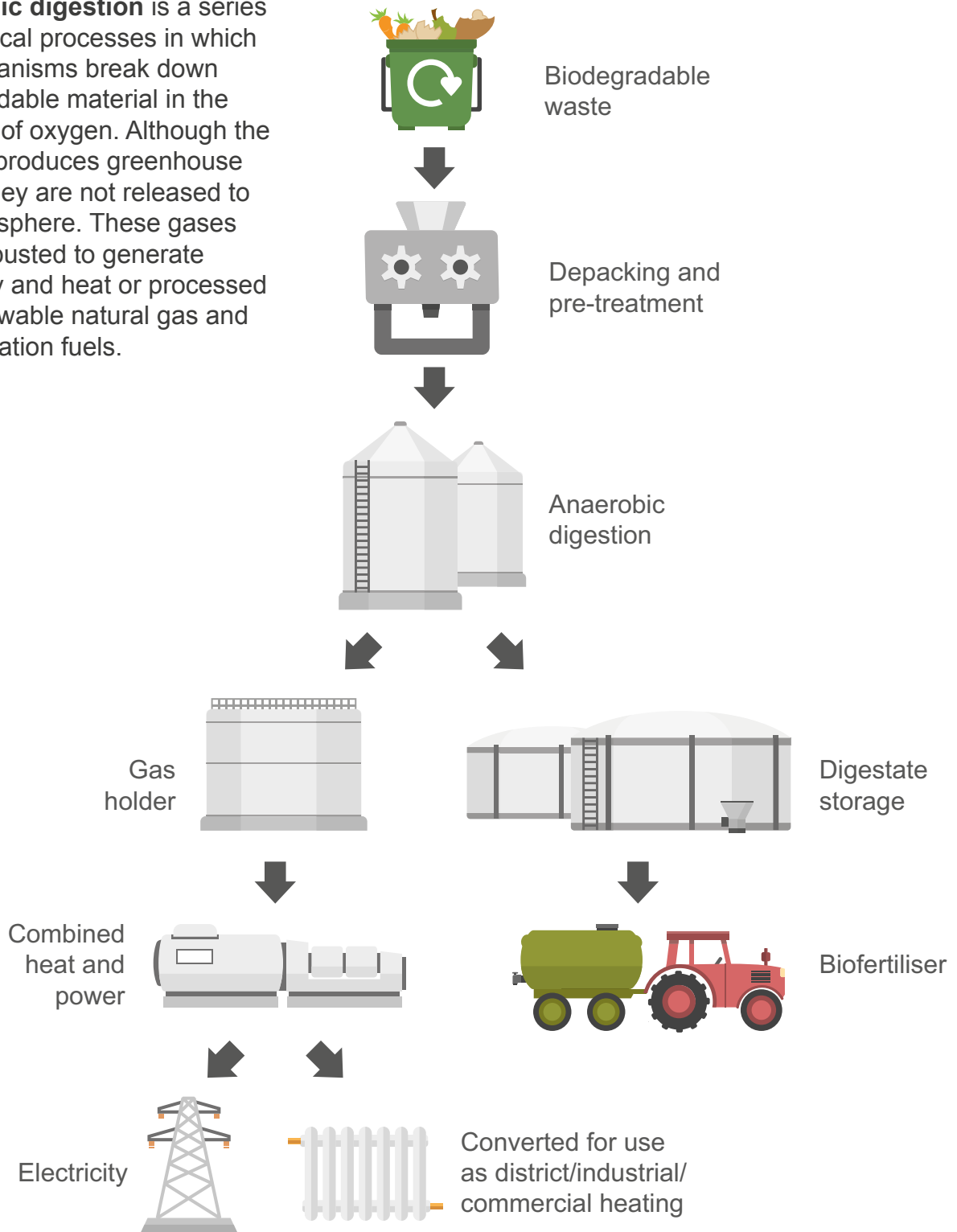
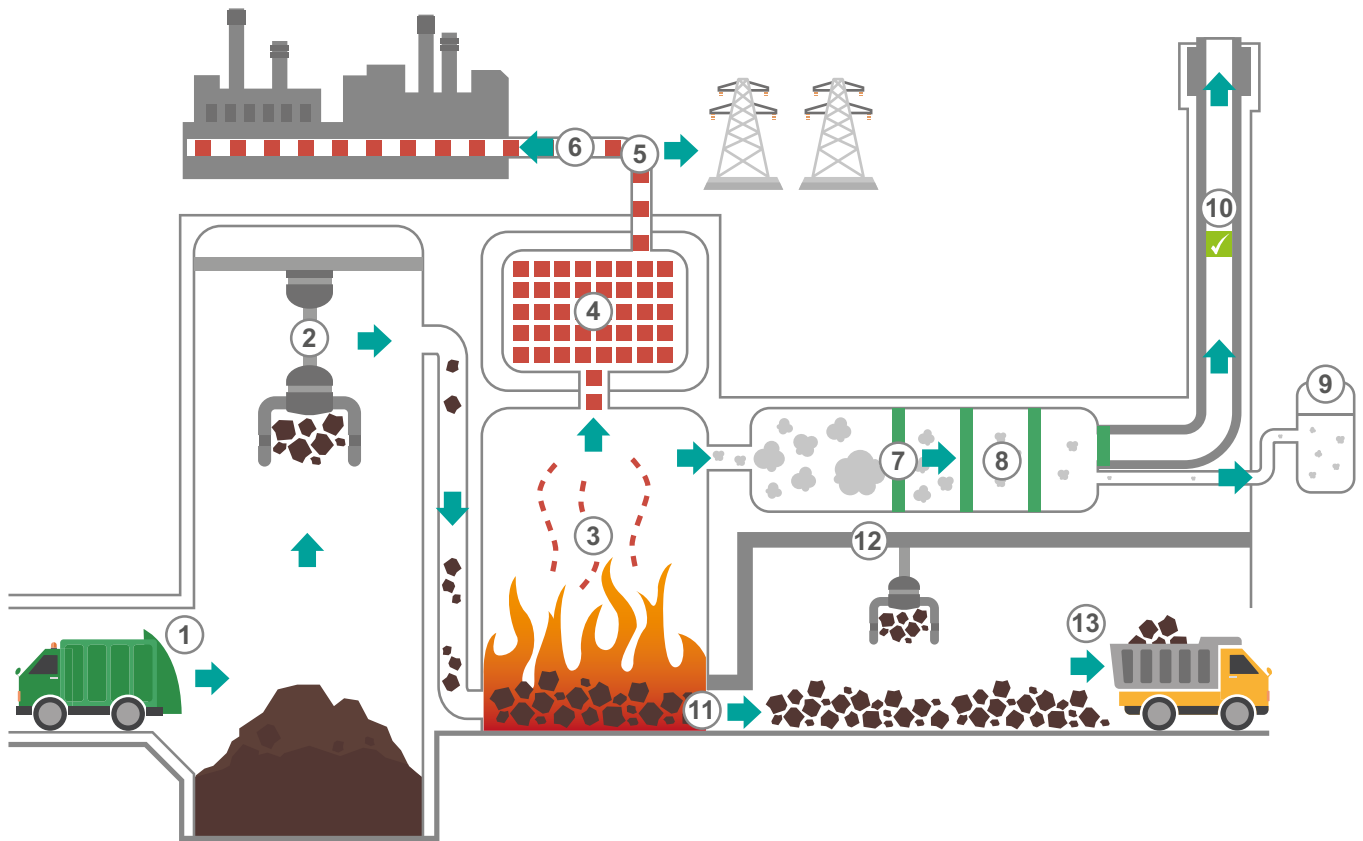


Figure 6 – how energy from waste works



- 1 Residual waste is left on the kerbside and collected and transported by councils to the energy from waste facility.
- 2 The waste is fed into the incinerator.
- 3 It burns at temperatures over 850°C.
- 4 Heat enters a boiler to produce steam.
- 5 Steam powers a turbine that generates electricity for homes and businesses.
- 6 Excess heat can be piped to neighbouring buildings for heating.
- 7 Harmful gases are removed.
- 8 Particles are filtered.
- 9 Material collected by the air clean up system is sent for treatment.
- 10 All emissions are monitored to meet strict environmental standards.
- 11 Ash is collected at the bottom of the incinerator.
- 12 Magnets remove any remaining metals for recycling.
- 13 Ash left over can be used in construction projects such as new roads

For an operator to classify its residual waste facility as meeting the EU's R1 standard, it has to ensure that its plant is an energy recovery facility rather than a waste disposal facility. Specifically:

- the combustion of waste must generate more energy than the consumption of energy by the process itself;
- the greater part of the waste must be consumed during the operation;
- the greater amount of the energy generated must be recovered and used (either as heat or electricity); and
- the waste must replace the use of a source of primary energy (such as coal or gas).

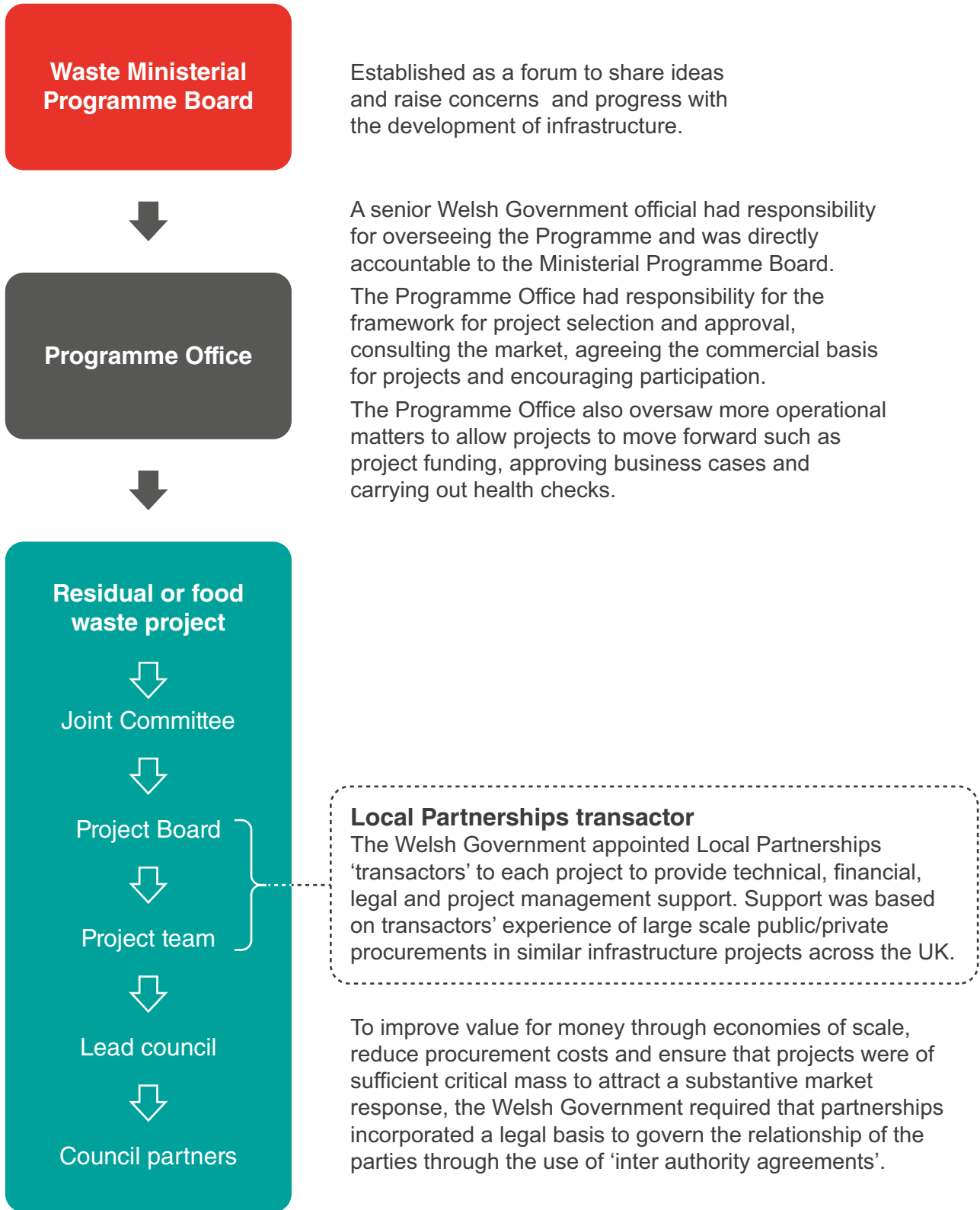
## The Welsh Government managed the Programme well, with a clear emphasis on collaboration

There was a clear and structured programme management approach and the Welsh Government made good use of specialist expertise

- 1.5 To manage what was a large and complex Programme, the Welsh Government developed a clear structure and approach (**Figure 7**). The Welsh Government did not have the necessary technical, commercial, legal and financial skills and capabilities to manage the Programme by itself. It brought in Local Partnerships<sup>12</sup> secondees to set up and run a Programme Office. The Programme Office provided expert support to the Welsh Government and councils on topics such as planning, finance, contracting, programme management and commercial issues, while ensuring that projects were aligned with policy. Local Partnerships also had the remit to ensure that, as far as possible, the Welsh Government was investing wisely and that projects were deliverable.

12 Formed in 2009, Local Partnerships is now jointly owned by HM Treasury, the Local Government Association in England and the Welsh Government (the Welsh Government took a 5% stake in the company from January 2018). It works across numerous policy areas such as energy, waste, housing, assurance, health, finance and to help the public sector deliver at the local level supporting the delivery of investment in local infrastructure and local services.

Figure 7 – governance structure of the Waste Infrastructure Procurement Programme



- 1.6 Welsh Government officials consider that the programme and project-level support provided by Local Partnerships was essential in facilitating the overall management of the Programme and individual procurements. Participating councils also highly valued Local Partnership's project support. In the 10 years from April 2008 to March 2018 the cost of this support to the Welsh Government was £6.4 million.
- 1.7 The Welsh Government and councils particularly valued Local Partnerships' procurement advice and the resolution of complex technical and financial issues, using experience from other UK waste infrastructure projects. Local Partnerships also provided specific training sessions for council officers on procurement, negotiation skills, contract management and anaerobic digestion technology.
- 1.8 The procurement phase of Programme ended on 31 March 2018. Partner councils have indicated their wish for the Welsh Government to secure a call-off contract with Local Partnerships to help deal with any complex commercial or contractual issues that may arise during the operational phase of projects. In response to this call for continuing support, the Welsh Government has agreed a new package of work with Local Partnerships for ongoing commercial support for operational projects. The work started in April 2018 and contracts are on a yearly rolling basis. The Welsh Government budgeted £0.9 million for the work in 2018-19, but is expecting to spend considerably less. This work will include continued focus on achieving best value for money and council contract management support as well as developing projects for additional treatment infrastructure.

The Welsh Government emphasised that partnerships between councils would improve value for money through economies of scale and attract more interest from the private sector, although there were difficulties in some cases

- 1.9 The Welsh Government was more likely to provide support for both food and residual waste projects where councils came together to form partnerships. Overall, there are ten projects across the programme involving 19 councils. Nine of the projects are partnerships involving more than one council<sup>13</sup>. The only councils that have not taken any part in the Programme are Carmarthenshire, Neath Port Talbot and Wrexham.
- 1.10 There are currently seven food waste projects, all of which are operational and three residual waste projects, two of which are operational ([Appendix 2](#)). Two residual waste partnerships in South Wales, Prosiect Gwyrdd and Tomorrow's Valley, use the same facility at Trident Park, Cardiff. The other residual waste facility in North Wales is currently under construction. The only single council project is Prosiect GwryAD, a food waste project run by Gwynedd Council. Gwynedd Council decided that, taking into account transport costs, it would be better value for money to procure a local facility rather than join with the North-East Wales food waste project. The Welsh Government approved this decision.
- 1.11 The original South West Wales food waste project, which involved Bridgend, Carmarthenshire, Neath Port Talbot, Pembrokeshire and Swansea councils, was stopped in 2013. The preferred bidder pulled out for 'commercial reasons' just days before it was expected to sign the contract. This resulted in abortive costs of around £3 million across the five councils involved, including costs incurred by the councils and the Welsh Government's contribution. Post project evaluation suggested there was nothing the Welsh Government or councils involved could have done to reverse the bidder's commercial decision.
- 1.12 The failed South West Wales procurement meant that some councils lost their appetite to reinstate the partnership. Swansea and Bridgend councils have since established a separate food waste partnership through the Programme. Pembrokeshire County Council joined the Central Wales food waste partnership established by Ceredigion and Powys councils.

<sup>13</sup> Part 2 of this report describes arrangements that some councils have made for residual and/or food waste treatment outside of the Programme.



- 1.13 The same company involved in the failed South West Wales procurement also pulled out of the original Heads of the Valleys food waste project in early 2014, in the latter stages of the procurement process. The project resumed later in the year with the inclusion of Monmouthshire County Council who were not previously part of the project. However, Caerphilly County Borough Council withdrew from the project because it thought it could get better value for money by continuing to use a facility located in the county. Overall the Welsh Government contributed around £2 million to the procurement of the original project and its successor<sup>14</sup>.
- 1.14 The failed South West Wales food waste procurement was also the main reason why the same five councils suspended a South West Wales regional residual waste project in the very early stages. The councils have made their own interim arrangements until they can find a long-term solution. The terminated project resulted in procurement costs of around £0.5 million<sup>15</sup>. Councils rejected the residual waste project for the following reasons:
- a their perception that there was insufficient waste to attract market interest for a facility; and
  - b that existing residual waste treatment arrangements were not aligned with each other and that it would take several years for all of the councils in South West Wales to be in a position to look for a joint long-term solution.
- 1.15 However, in early 2018, Bridgend, Carmarthenshire, Ceredigion, Pembrokeshire, Powys and Swansea councils restarted a collaborative process to explore if there is now private sector interest to manage a residual waste facility serving the area<sup>16</sup>. The outcome could take the form of a new facility within the area or merchant capacity elsewhere. This would take several years to come to fruition, but the Welsh Government is jointly funding a project scoping exercise and will support the partnership with early market engagement. The councils have updated some of the early work on the previously suspended project to use on the current project.

14 We do not know the costs incurred by councils.

15 Some of the costs were incurred before the establishment of the Programme.

16 Earlier in the Programme, Powys and Ceredigion councils had explored options for a joint residual waste project but this did not proceed past the early stages of development.

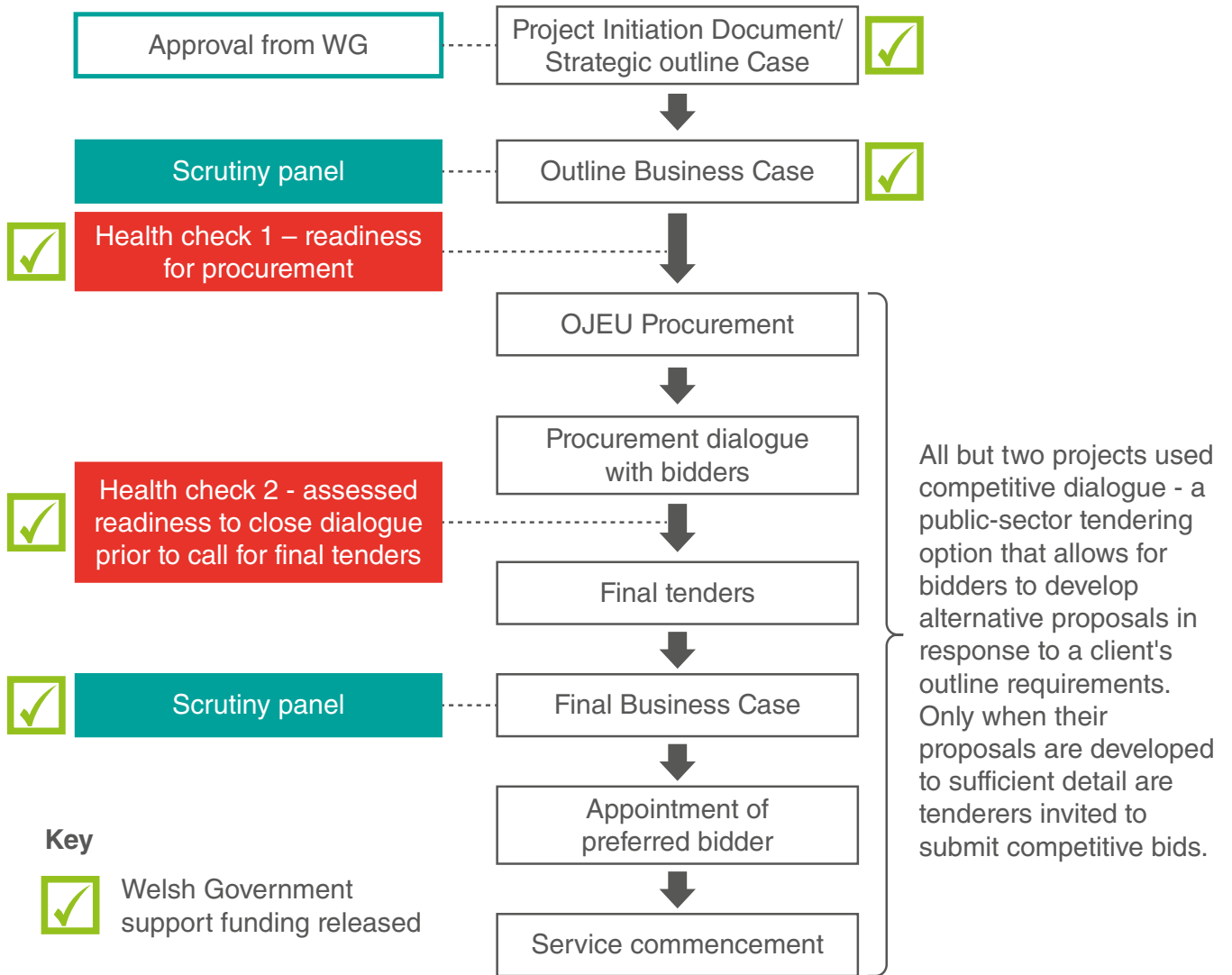
- 1.16 The Welsh Government required partnerships to enter into binding Inter Authority Agreements to establish councils' respective rights and obligations during initial project development. As part of the Full Business Case approval process, the Welsh Government also required a second binding Inter Authority Agreement to establish their respective rights and obligations during the contract lifetime. A 'lead authority' for each project took on the role of signatory for the contract with the private sector provider. The other councils in the partnership contracted with the lead council to use capacity at the facilities.
- 1.17 The Welsh Government's Programme Office considered that Inter Authority Agreements generally worked well. However, there were examples where individual councils failed to meet their obligations with each other. Examples included delays agreeing an equitable and fair distribution between partners of the costs of transporting waste to facilities. Some councils also failed to provide the level of staff resource anticipated by the Inter Authority Agreement. In these cases, the shortfalls in staff resources were covered by other partners. Nevertheless, this led to project delays while cover was arranged.
- 1.18 The partnerships' governance arrangements varied according to the organisational composition of the individual councils, the preferences of the lead authority and matters specific to a particular partnership. However, all projects had a project board with representatives from each partner council Local Partnerships and a joint committee made up of members from each partner council. The joint committee would usually determine issues not delegated to project boards. It was typically the key decision-making body, subject only to specific decisions delegated to each partner council.

## The Programme used a consistent and rigorous project management approach, which worked well generally despite some councils' limited experience

- 1.19 The Welsh Government required that all residual and food waste projects under the Programme followed the same project development, procurement and quality assurance process. The Welsh Government based the project development process on the widely used Five Case Business Model<sup>17</sup>. The Welsh Government also specified that partnerships should procure projects using the competitive dialogue process (Figure 8).
- 1.20 The Welsh Government's decision to adopt the Five Case Model across all projects met with a mixed response from participating councils. Most councils found the process useful. However, for some it was a new experience, which meant a steep learning curve. Some councils felt that the amount of work needed to comply with the process for food waste projects was unwarranted given their size relative to the scale and cost of the residual waste projects. The Welsh Government's view was that councils were still entering into long-term (15 year) service contracts with many of the same types of risks associated with the residual waste contracts.
- 1.21 The Welsh Government aimed to adopt a flexible and proportionate approach. Some partnerships wanted to follow the Welsh Government's summary guidance for using the Five Case Model, which recommends that smaller, less complex proposals can be developed using a single business case rather than an iterative approach. The guidance allows this approach where 'firm' prices are available from a pre-competed arrangement, including framework contracts, but not for projects that are novel or contentious.

17 The Five Case Model provides a framework and tools to enable effective project development and decision making when scoping and planning spending proposals in a robust and thorough manner and can be used at the strategy level, the programme level and individual project level. Its use should always be proportionate to the level at which it is being applied as well as the cost and risk associated with the investment. The five cases are: strategic, economic, commercial, financial and management.

Figure 8 – project development, procurement and quality control process for the Waste Infrastructure Procurement Programme



Notes:

- 1 Health checks assess whether project s remain deliverable, affordable and in line with previously approved objectives.
- 2 Scrutiny panels made up of Welsh Government officials from a range of different departments approved the Outline Business Case and Final Business Case.
- 3 The final two projects, Heads of the Valleys and South West Wales food projects used the Competitive Procedure with Negotiation process. Competitive Dialogue with Negotiation allows for negotiations after tenderers have submitted formal bids. However, it requires that greater articulation of minimum requirements at the point of inviting tenders.

- 1.22 In practice, the Welsh Government viewed all projects in the Programme as novel and potentially contentious because of the use of new technology, long-term contracts and the use of energy from waste technology for residual waste. The Programme Office emphasised to us its view that using the full Five Case Model process was necessary to better manage risk and ensure robust project development.
- 1.23 The procurement process was largely successful, notwithstanding the issues that led to the termination of the original South West Wales projects ([paragraph 1.11](#)) and the initial plans for the Heads of the Valleys food waste project. Each procurement received a good initial market response with the number of bidders reducing as the process progressed, as is customary in a Competitive Procedure with Negotiation process. Some partnerships eliminated bidders because they did not meet criteria and others dropped out for commercial reasons. At the time for submitting final tenders, four projects had only one bidder remaining. In all four cases, to maintain a sense of competition, councils did not tell the remaining bidder that they were the only organisation left in the process.
- 1.24 There were no legal challenges from any unsuccessful bidders. However, Local Partnerships considers that the concern about the potential for a procurement challenge led in some cases, to partnerships being overly risk averse.
- 1.25 All facilities used by the partnerships under the Programme received planning consent for proposed food and residual waste treatment facilities without major issues. In contrast, a National Audit Office review<sup>18</sup> of three major waste projects in England found that the three projects it examined all experienced significant delays resulting from a range of problems. In particular, the report noted difficulties in obtaining planning permission with opposition from local groups, complex commercial considerations and uncertainties over technology. Local Partnerships, the Welsh Government and councils were able to draw on lessons learnt from Defra sponsored projects.

18 National Audit Office, [Oversight of three PFI waste projects](#), June 2014.

- 1.26 However, the Welsh Government took the decision to include R1 status (paragraph 1.4 and Box 2) as a condition for supporting residual waste projects several months after it issued the standard form of contract. Because this accreditation is not a condition of funding for waste projects outside of Wales, bidders for the residual projects were unfamiliar with the condition imposed and had to become comfortable with the proposed management of this risk. Local Partnerships' view was that the positive relationships that had developed between the bidders and project teams helped negotiations. Nevertheless, the negotiations required additional procurement time and cost.
- 1.27 The average time from the Welsh Government's approval of the outline business case to operation for the seven operational food waste projects was just under four years<sup>19</sup>. The length of time of time taken was mainly due to:
- a the highly technical nature of the projects and the need for detailed negotiation with bidders to find the right solution;
  - b the councils and bidders using an unfamiliar procurement process;
  - c council officers being unavailable to make key decisions; and
  - d bidders needing to secure funding to enable construction of facilities.
- 1.28 For similar reasons to the food waste projects, the time taken from the Welsh Government's approval of the outline business case to operation for the three residual waste projects averaged more than four years. In the case of the North Wales Residual Waste Treatment Project, procurement took six years, for reasons including:
- a there were two original sites made available for bidders, one on Anglesey and a site in Deeside. The favoured site on Anglesey was withdrawn by the owners and the partnership had to allow bidders to move their bids to the other site;
  - b a change in ownership for one of the bidders resulted in changes to their proposed finance model;
  - c land use restriction issues;

<sup>19</sup> Projects did not set target times. The longest project from the Welsh Government's approval of the outline business case to delivery was the Cardiff Organic project which took five years and four months. The shortest was Central Wales which took two years and five months.

- d the requirement to maintain dialogue with seven bidders during the early stages of procurement; and
- e withdrawal of one of the two bidders at the final procurement stage and managing the risks of continuing the process with one bidder.

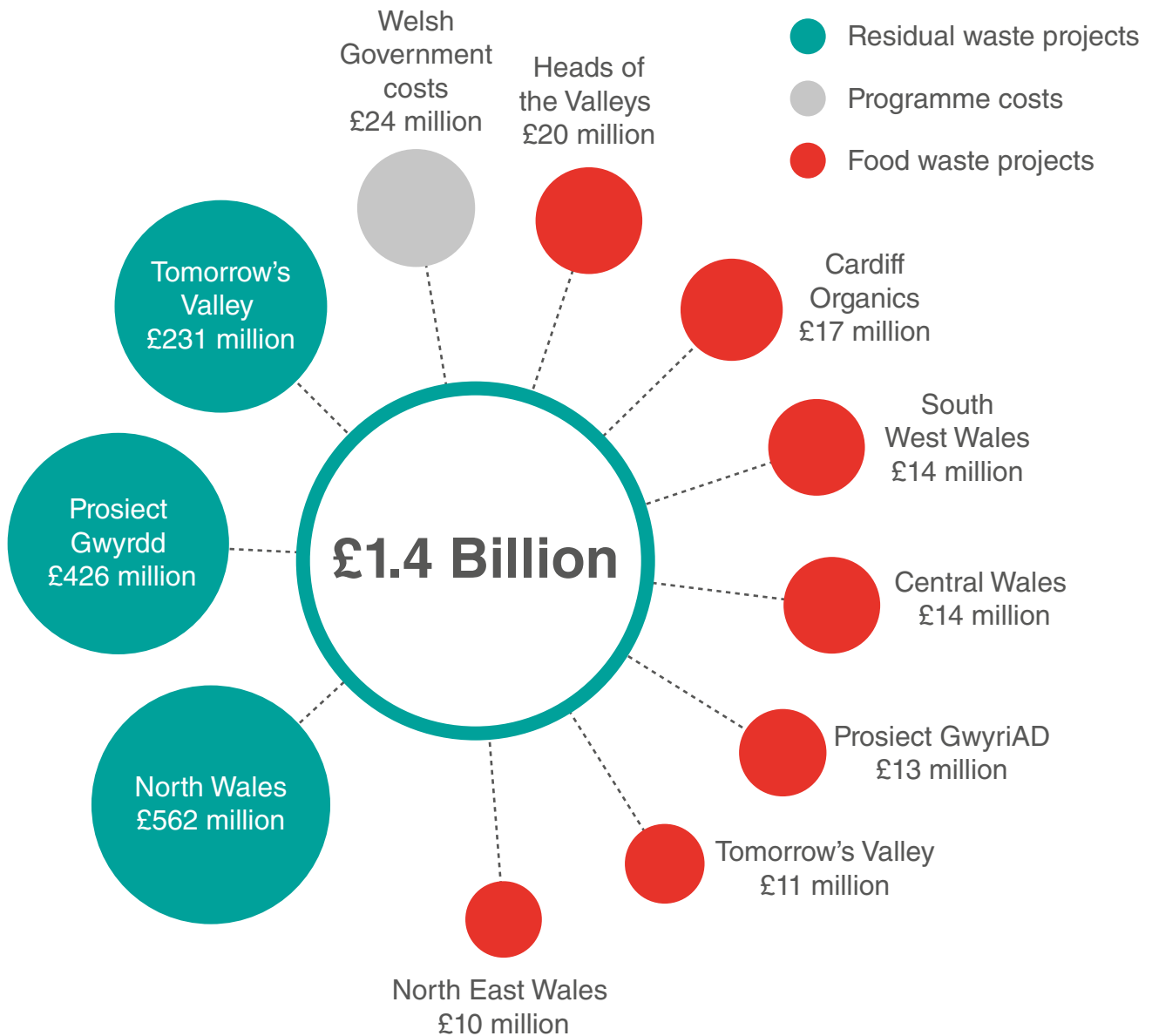
1.29 As part of the approval process, the Welsh Government reserves rights so that once projects are operational, councils inform them of any change to a contract or the risk profile. The Welsh Government also has the right to require regular meetings with councils to establish the progress of the project against projections. However, there is no current requirement for partnerships to provide any management information on the on-going total costs and the amount of waste going through facilities. The Welsh Government is working with Local Partnership transactors on an agreed method to obtain from partnerships annual information on cost, tonnages of waste and any operational issues.

**The total cost of the Programme is projected to be in the region of £1.4 billion to 2044-45, which is lower than initial estimates but will depend on the amount of waste that needs treating**

**The Welsh Government expects to contribute around £342 million to the projected £1.4 billion cost, making waste treatment capacity more affordable for councils and with these costs lower than initial estimates**

1.30 The estimated total cost of the Programme to the public sector until the end of the last remaining contract (in 2044-45), will be in the region of £1.4 billion (Figure 9). These estimates are based on waste volumes in final business cases for all projects. Based on these figures, the residual waste projects will account for 90% of the expenditure, food waste projects 8%, with the Welsh Government's programme costs totalling 2%.

Figure 9 – projected Waste Infrastructure Procurement Programme costs, to 2044-45



Notes:

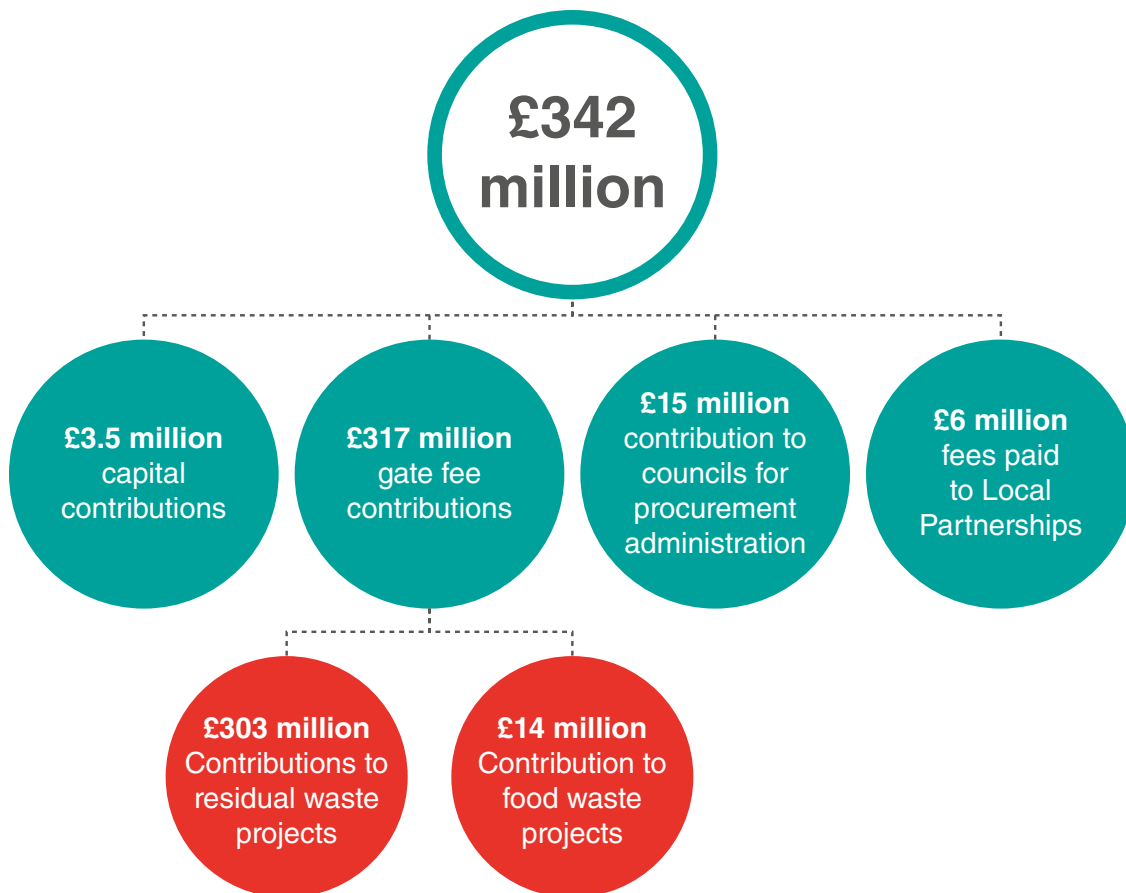
- 1 Residual waste projects have a duration of 25 years, food waste projects 15 years. Contributions for gate fees started in 2013-14 and will continue until 2044-45. Welsh Government contributions to individual projects are included in the costs for each project. Welsh Government funding is broken down in **Figure 10**.
- 2 Project costs include revenue (gate fee contributions and procurement contributions) and capital contributions from the Welsh Government.

Source: Welsh Government (project business cases)



1.31 The Welsh Government is expecting to invest in the region of £342 million over the lifetime of the Programme, the majority of which (£317 million – 93%) is gate fee contributions for individual projects (Figure 10). The Welsh Government’s financial support is mainly in form of a fixed contribution towards gate fees. The Welsh Government’s fixed contribution is based in most cases on 25% of the overall gate fees estimated in projects’ final business cases, and 15% where the Welsh Government has made a capital contribution (Box 1). The Welsh Government contribution towards gate fees is spread evenly through the life of the contracts. These contributions will make projects more affordable for participating councils. The Welsh Government’s investment is significantly less than the £484 million over the lifetime of the programme estimated in projects’ outline business cases. Overall, the gate fees of the projects in the programme are estimated to cost councils and the Welsh Government £850 million less than early estimates made in outline business cases.

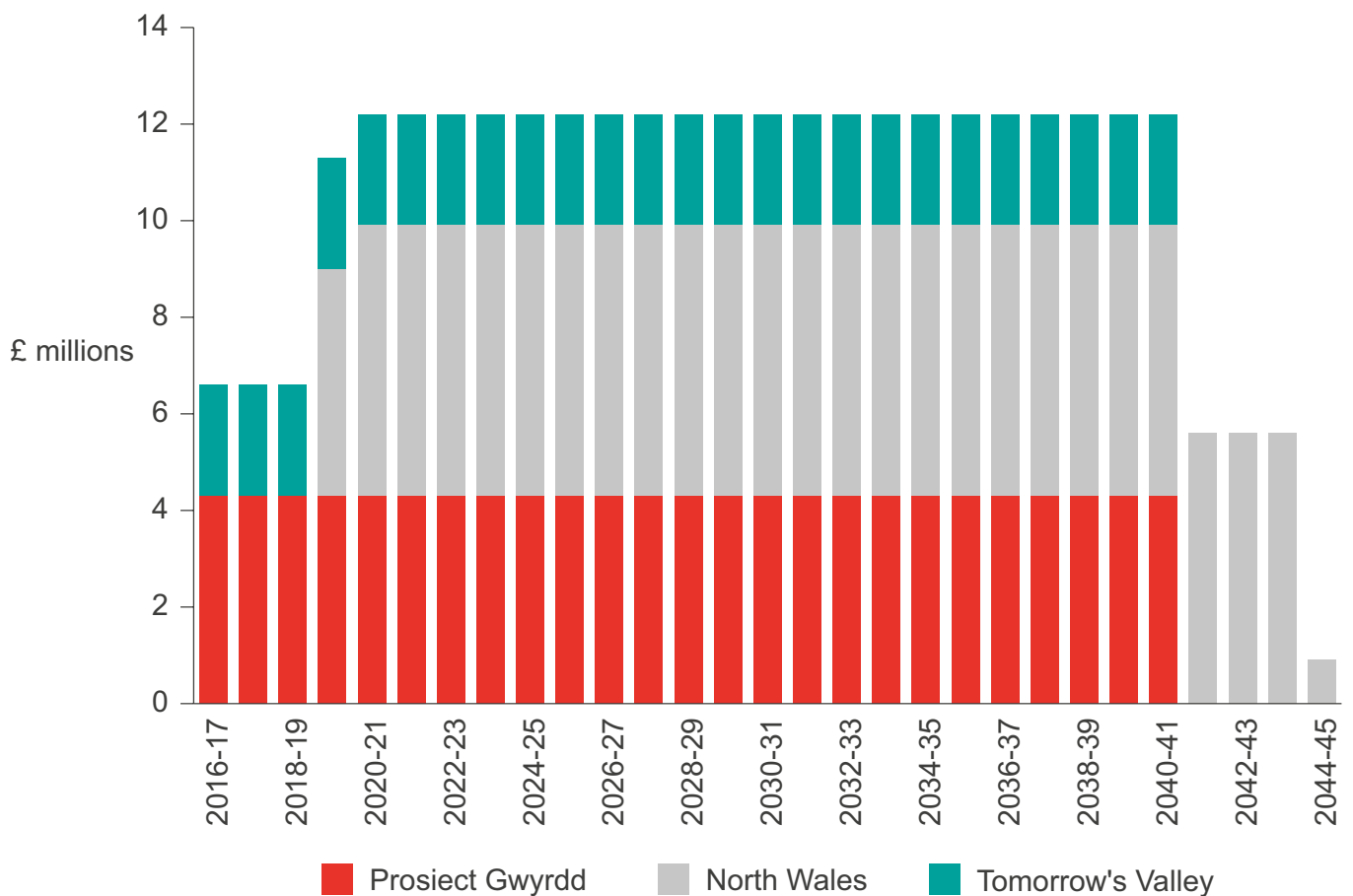
Figure 10 – the Welsh Government’s expected financial contribution to the Waste Infrastructure Procurement Programme, to 2044-45



Source: Welsh Government

1.32 Welsh Government funding for the residual waste projects will cease after 2044-45 when the North Wales project ends (Figure 11). Funding for the food waste projects will end in around 2032-33 at the end of the Heads of the Valleys project.

Figure 11 – the Welsh Government’s expected financial contributions to gate fees for residual waste projects



Note:

The figures on the graph are based on information from the Welsh Government provided in early 2018. The Welsh Government’s actual contribution to the North Wales project will depend on exactly when in 2019/20 the facility starts accepting waste (currently scheduled for April / May 2019). Similarly, the contribution in 2044-45 will depend on exactly when the contract ends.

Source: Welsh Government

- 1.33 The Welsh Government also contributed to projects' procurement costs. The average Welsh Government contribution across all projects was £1.2 million. The highest contribution was £2 million for the failed South West Wales food waste project (13% of all Welsh Government procurement contributions). The average Welsh Government contribution to procurement costs for the three residual waste projects was £1.5 million<sup>20</sup>.
- 1.34 The Welsh Government also provided £3.5 million of capital funding across three food waste projects: Prosiect GwyriAD, North East Wales and Tomorrow's Valley. The funding was for facilities that would revert from private sector ownership to council ownership at the end of the contract. The facility under construction for the North Wales residual waste project will also revert to council ownership at the end of the 25-year contract, but did not receive capital funding from the Welsh Government. The Welsh Government is of the view that the existing food waste facilities will continue to operate after the end of the contracts, whereas technology for dealing with residual waste is more likely to evolve, potentially negating the need for these facilities in the future<sup>21</sup>.

**The estimated cost of each project is based on a projection of the amount of waste that will require treatment, but this is inherently uncertain**

- 1.35 The projects have determined the costs for both the residual and food waste contracts using a projection that models the amounts of waste that they consider will be produced in each year of the contracts. Projections take into account considerations such as predicted changes in population, economic growth, consumer behaviour, changes in retailer materials use, legislation, waste minimisation initiatives, recycling performance and changes in the commercial waste market.
- 1.36 We found that partnerships used the best available data for future waste projections when they developed their final business case. In addition, when independent Local Partnerships transactors assessed each project's final business case, they determined that each project had undertaken sufficiently detailed scrutiny of the modelling assumptions. However, as these contracts are either 15 years or 25 years in length, any projections are inherently uncertain.

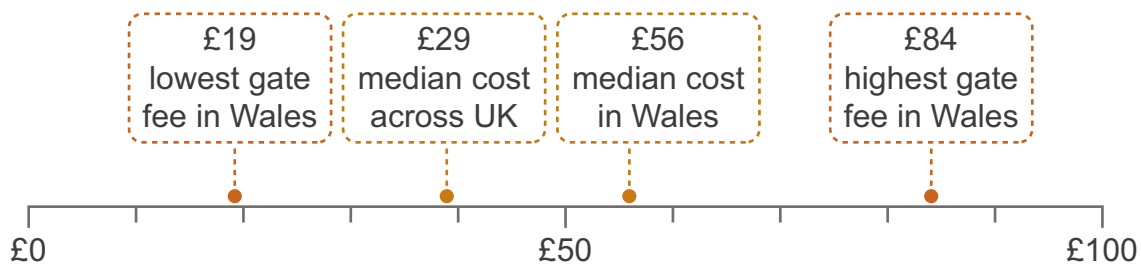
<sup>20</sup> The Welsh Government also contributed £0.5 million towards the procurement costs for the suspended South West residual project (paragraph 1.11) and £40,000 to a Central Wales residual project. The Central Wales residual project did not progress past the early stages of development because best value for money was proven to exist with a joint project with the South West Wales Residual Waste Partnership.

<sup>21</sup> The Welsh Government's capital contribution to the three waste projects was part of the Strategic Capital Investment Framework (SCIF). The SCIF was a central framework for capital investment across all public services in Wales and operated over three years from 2008-09.

In general, gate fees per tonne for food waste projects are higher than the rest of the UK, although they are costing less than anticipated in early estimates

- 1.37 Gate fees for the food waste projects range from £19 per tonne to £84 per tonne (Figure 12). In their June 2017 analysis of gate fees for the calendar year 2016<sup>22</sup>, the Waste and Resources Action Programme (WRAP)<sup>23</sup> reported that the median cost for anaerobic digestion waste treatment across the UK over the calendar year 2016 was £29 per tonne.
- 1.38 The median cost for food waste projects in the Programme is £56 per tonne, which is the same for all projects including those outside the Programme. The higher cost in Wales compared to the rest of the UK is because at the start of the Programme, the projects and facilities were relatively small reflecting that there was little market at the time for anaerobic digestion projects in Wales. There are various other factors which determine the gate fee including, where relevant, transportation costs.

Figure 12 – cost per tonne of food waste treated in the Waste Infrastructure Procurement Programme projects in 2016



Source: WRAP, Welsh Government and individual projects

22 Waste and Resources Action Programme, **Gate Fees Report 2017: comparing the costs of waste treatment options**, July 2017.

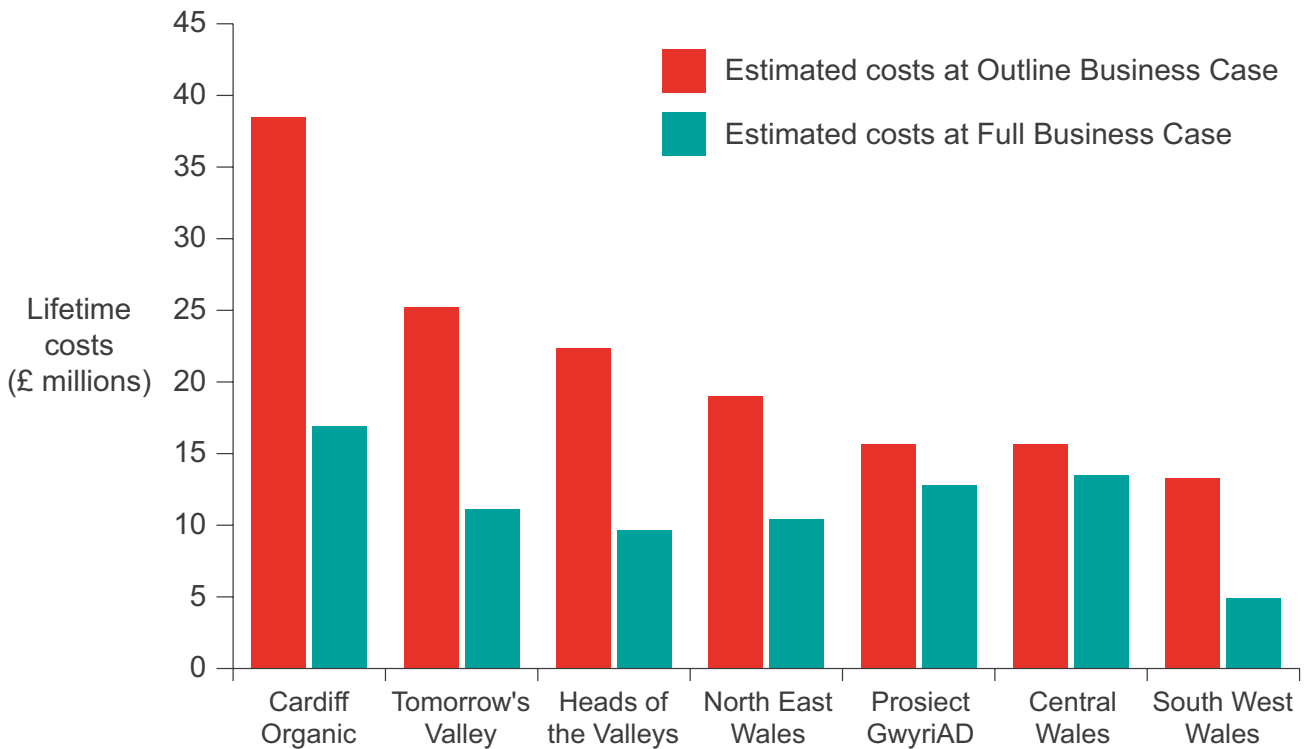
23 WRAP is a registered charity. It works with businesses, individuals and communities to achieve a circular economy through helping them reduce waste, develop sustainable products and use resources in an efficient way.

1.39 For all food waste projects, the estimated whole-life project costs at the final business case stage is less than estimated at the outline business case stage (Figure 13), based on the same waste projections. In three cases, the costs estimated at the final business case stage were significantly less. According to the Welsh Government, reasons for this include:

- a partnerships were able to maintain competitive tension between bidders and due to well-managed, effective dialogue and procurements.
- b economies of scale, through partnership working.
- c there were market changes between the time when most partnerships developed outline business cases and final business cases. For example, as developers built more food waste facilities, they needed enough food waste to ensure that they operated as efficiently and economically as possible. This meant that bidders were offering lower gate fees for the treatment of food waste than at the start of the Programme when there were fewer facilities and less competition.
- d early outline business cases were based on Design Build Finance Operate<sup>24</sup> solutions where the construction costs would be effectively paid off by councils over the contract term. However, six of the winning solutions were 'merchant' facilities meaning that the gate fees were lower. The reason for this was that the lifespan of these facilities were longer than the council's contract terms and so the development of facilities could be paid off over a longer period.
- e merchant facilities were built with capacities larger than those needed to only treat municipal waste. This benefitted councils with further economies of scale, as fixed costs could be apportioned over greater tonnages processed (unit cost per tonne was lower).

24 The private sector party assumes the entire responsibility for the design, construction, finance, and operate the project for the period of concession.

Figure 13 – the estimated costs of the Waste Infrastructure Procurement Programme food waste projects at outline business case and full business case



Source: Project business cases

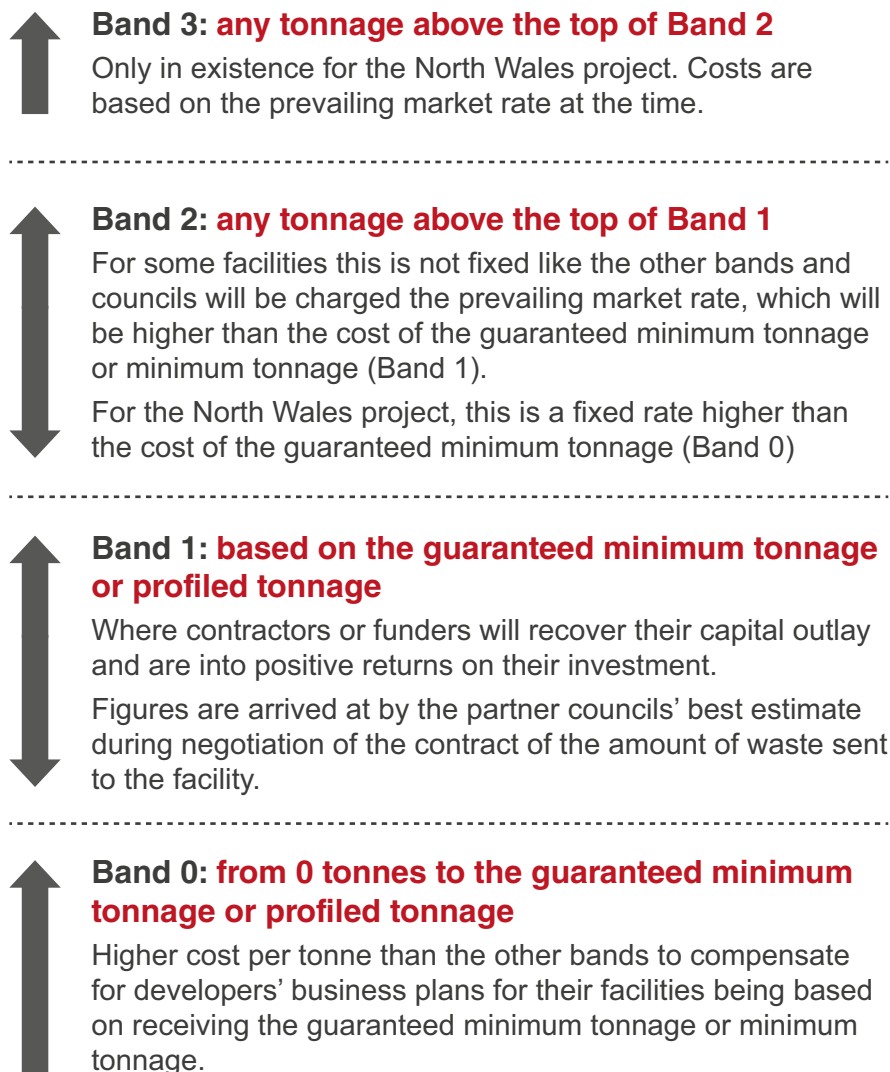
**Gate fees per tonne for two of the three residual waste projects compare favourably with similar projects across the UK, and are significantly less than anticipated in early estimates**

1.40 The treatment costs for the North Wales and Prosiect Gwyrdd residual waste projects are determined by the use of gate fee ‘bands’<sup>25</sup>. These bands are based on the amount of waste sent to facilities (Figure 14). The starting point is the minimum amount of waste councils are obliged to deliver or pay for, based on councils’ best estimates of what they will be sending to the facility<sup>26</sup>. The gate fee structure for the Tomorrow’s Valley project is a fixed rate per tonne with no bandings and no defined minimum tonnage levels.

25 Blended gate fee is the single averaged gate fee figure of all bands that is worked out based on the tonnage input.

26 Where this report refers to ‘gate fees’ for the Prosiect Gwyrdd and North Wales residual waste projects it refers to the blended gate fee. Given that there potentially four different gate fees dependent on tonnage throughput through a facility, decision makers use the ‘blended gate fee’ to simplify gate fees into one averaged figure.

Figure 14 – cost bands for the North Wales and Prosiect Gwyrdd residual waste projects



**Note:**

The wording of the Prosiect Gwyrdd contract guarantees a minimum payment rather than a guaranteed minimum tonnage although the principle is the same.

- 1.41 WRAP's June 2017 analysis of gate fees across the UK (paragraph 1.37) reported a median cost for post-2000 energy from waste facilities as £91 per tonne. Two of the Welsh residual waste projects fall below the median, with one significantly above because it is a smaller project<sup>27</sup>.
- 1.42 Local Partnerships provided us with a separate analysis comparing gate fees for the three Welsh residual waste projects with 22 similar Defra-sponsored projects in England<sup>28</sup>. The analysis showed that:
- a the three Welsh projects are within the range of the Defra projects, with two towards the lower end of this range of gate fees;
  - b one of the Welsh projects is the fourth lowest cost in England and Wales, and another is the seventh lowest cost;
  - c the other Welsh project is the ninth highest cost project in England and Wales and the third highest cost of all energy from waste projects compared<sup>29</sup>; and
  - d on average and when landfill taxation is included, the cost of residual waste disposal through the three Welsh projects is less than the cost would be if the same waste was disposed to landfill<sup>30</sup>.
- 1.43 The overall estimated lifetime costs of the residual waste projects is on average 41% less than estimated at the outline business case stage (Figure 15). As was the case with the food waste projects, the Welsh Government is of the view that residual waste projects are benefitting from better economies of scale than expected at the outline business case. The facilities are also predicting higher than expected income both from treating more waste than anticipated from third parties and electricity generation. This helped partnerships negotiate lower gate fees.

27 We have not provided the same level of analysis for the residual waste projects as food waste projects because there are only three projects which are easily identifiable and gate fees are commercially confidential.

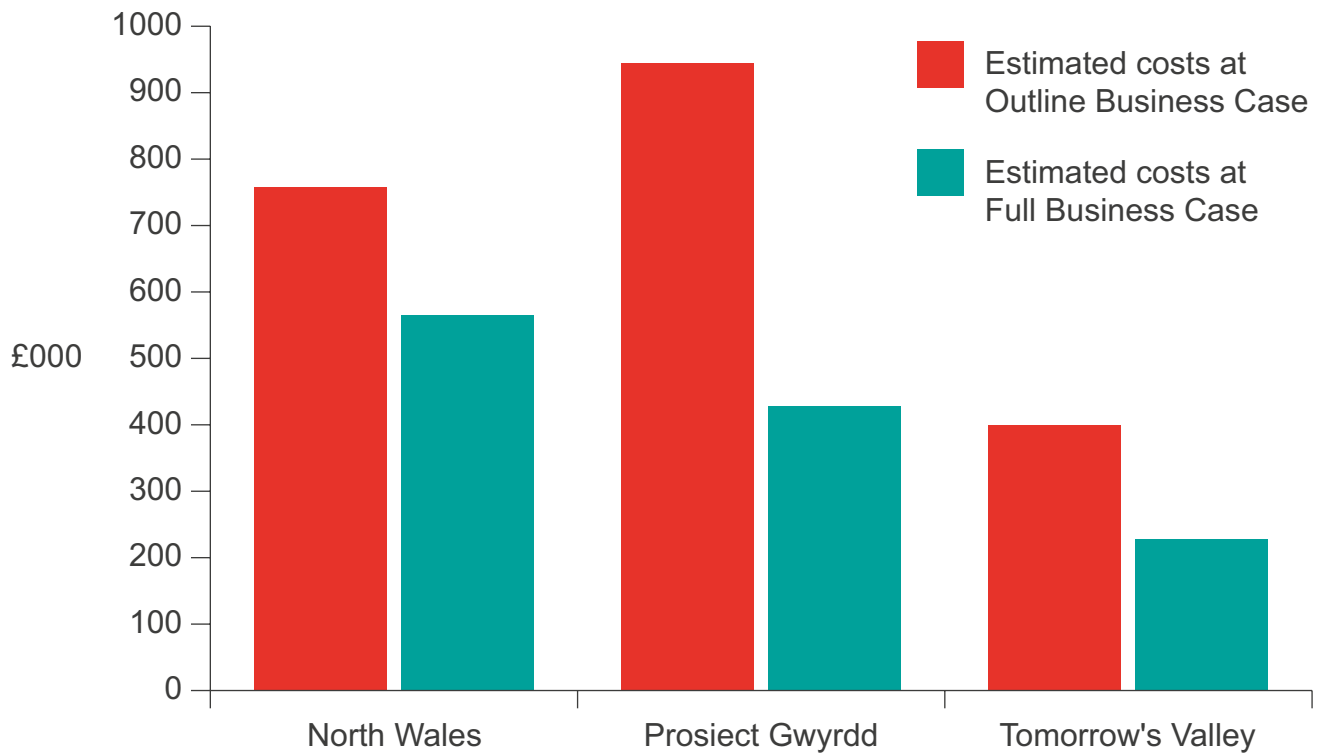
28 Local Partnerships were not able to carry out the same analysis for food waste projects.

29 Six of the nine higher cost projects use Mechanical Biological Treatment (MBT) rather than energy from waste. Mechanical Biological Treatment is a residual waste treatment process that involves both mechanical and biological treatment. MBT can be configured to achieve several different aims including pre-treatment of waste going to landfill; diversion of non-biodegradable and biodegradable municipal solid waste going to landfill through the mechanical sorting into materials for recycling, and/or energy recovery as refuse derived fuel (RDF).

30 Landfill tax is currently £88.95 per tonne for non-inert wastes, which is applied in addition to landfill gate fees, which for most councils vary between about £15 and £30 per tonne.



Figure 15 – the estimated costs of the Waste Infrastructure Procurement Programme residual waste projects at outline business case and at full business case



Source: Project business cases

## Risks remain for residual waste projects in particular and the projections used as the basis for these contracts do not align well with the Welsh Government's overall aspiration of zero residual waste by 2050

- 1.44 Although most councils have found medium to long-term solutions for the treatment of their waste, risks remain. We identified particular risks around the treatment of residual waste based on two possible scenarios:
- a that councils collect and take for treatment a consistent and static amount of residual waste for the duration of their contracts, and the targets for waste reduction in Towards Zero Waste are not met; or
  - b the amount of residual waste that councils collect and take for treatment reduces by more than was envisaged when the contract was set up, leaving councils to pay for capacity that they are not using.

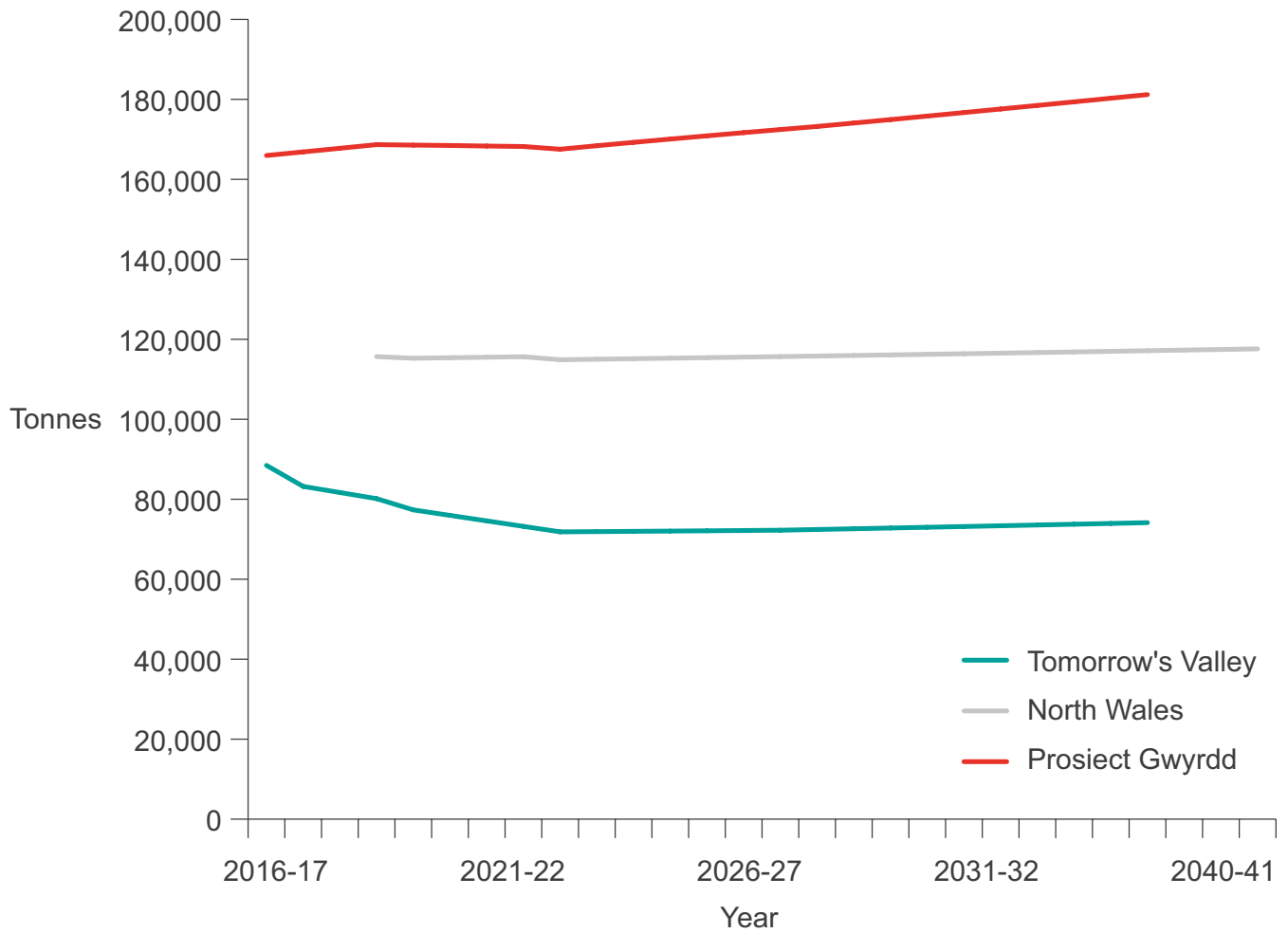
## The Welsh Government aspires for there to be no residual waste by 2050 but projections for the three residual waste projects assume that councils will still need to treat significant volumes of residual waste beyond 2040

- 1.45 One of the aims of **Towards Zero Waste** is that there will be 'no residual waste' and 'no energy from waste' by 2050. The contracts for the three residual waste projects are due to end in 2040-41 (Prosiect Gwyrdd and Tomorrow's Valley<sup>31</sup>) and 2044-45 (North Wales).
- 1.46 If councils are to achieve zero residual waste, we would expect to see a gradual decline over the period to 2050. However, the final business cases estimate that the overall amount of residual waste across the three projects will increase through the lifetime of the contracts (**Figure 16**)<sup>32</sup>. Together these three projects cover 14 councils. The business cases assume that these councils will still need to treat some 372,000 tonnes of residual waste in 2040-41 (the final year of when all three contracts will still be live). This represents an increase of 8,000 tonnes from the first year that all three residual projects will be live in 2019-20. The projections for the North Wales facility do not anticipate any reduction in the amount of residual waste that will need treating right through to 2044-45.

31 Prosiect Gwyrdd and Tomorrow's Valley contract with the same private sector provider at Trident Park, Cardiff.

32 Waste per head may decrease, but councils are projecting increasing populations.

Figure 16 – projections of waste arising from residual waste partnerships



Source: Project business cases

1.47 There are many factors such as economic activity that influence the amount of waste arising. Consequently, it is not possible to predict with certainty the amount of residual waste that councils will generate, particularly towards the later stages of the waste treatment projects. Nevertheless, if these projections are accurate then something significant would have to occur beyond 2040 to reach zero waste across these council areas by 2050. There is therefore a clear and obvious disconnect between the aspirations of the Welsh Government's long-term waste strategy and the projections that provide the basis for the residual waste contracts.

### Gate fee structures present certain financial risks for councils depending on the amount of residual waste they take for treatment

- 1.48 If there was a gradual reduction in residual waste arising over the duration of the contracts, the structure of project gate fees could result in councils paying higher gate fees per tonne. Prosiect Gwyrdd and the North Wales residual project have more complex contractual arrangements than the flat rate paid by the Tomorrow's Valley partnership. For the Prosiect Gwyrdd and the North Wales partnerships, if the amount of waste falls below the profiled tonnage or guaranteed minimum tonnage (Figure 14), councils will pay a higher gate fee per tonne. As noted in Figure 14, this minimum income to the contractor is to ensure that they recover their capital outlay.
- 1.49 To offset the risk of paying higher gate fees, both the Prosiect Gwyrdd and North Wales contracts, require the operators to use reasonable endeavours to secure alternative waste from elsewhere, for example from business, at the highest achievable price to make up the shortfall (known as 'substitute waste'). The gate fee the contractors secure for this waste aims to offset the shortfall in waste from the councils. If the substitute waste does not make up the shortfall, monthly reconciliation against projected waste will result in councils paying the higher gate fee (Band 0, as shown in Figure 14).
- 1.50 As noted in Box 1, the Welsh Government's contribution to gate fees has been fixed at either 25% or 15% of the overall fees estimated in projects' final business cases. This means that if a partnership sends more waste than they projected to their facility, they will receive a lower amount of Welsh Government funding per tonne sent for treatment.

## Partnerships have successfully transferred some other risks to the private sector, but these long-term contracts do not include break-clauses

- 1.51 One of the key aims of the Programme when negotiating contracts was to transfer risk to the party most suitable to manage it. Examples of successful risk transfer in the operational projects include:
- a most of the projects negotiated gate fees that provide councils with a good degree of protection from increases in inflation. Across the seven projects that we know include protection from inflation, on average 66% of the gate fee is not subject to inflation. This level of protection from inflation may have been reflected in the overall fees negotiated but provides a degree of cost certainty. The remainder of the gate fee is either subject to changes in the retail price index only, or changes in a range of indices such as average weekly earnings. The Tomorrow's Valley residual waste project is the only project where the entire gate fee is subject to inflation. However, the council partners and the Welsh Government are confident that the contract is 'highly affordable' because of a reasonable gate fee and the Welsh Government's grant contribution.
  - b all of the operational projects have protection from potential decreases in electricity prices. All of the food and residual waste plants will generate electricity from their processes (Figures 5 and 6). The plant operator will either sell the electricity to the grid or to local businesses. Factored in to each partnership's gate fee structure is the cost of electricity sales. Fixing this value means that if electricity prices reduce, the private sector operator rather than the councils will bear the risk. However, if the contractor sells the electricity generated for a higher price, both the partnership and the operator share the financial benefit.
  - c as there no direct capital investment in the facilities by partnerships (Box 1), private sector operators have carried the risk of construction cost increases. Although most of the facilities are operational, the North Wales residual facility is still under construction placing the councils in the partnership at risk from time over-runs. Any delays in construction will lead to the councils in the North Wales partnership having to continue with their current arrangements for disposing residual waste for longer. Contractors also hold the risks associated with plant maintenance and wear and tear. If there were serious issues which resulted in reduced capacity this would have no effect on the partnership and the contractor would have to identify alternative temporary arrangements. The North Wales partnership considers this scenario highly unlikely as there are clear commercial incentives for the contractor to ensure the plant is running to its capacity.

- d council waste has priority over third party waste for all the projects. This means that unless there is a significant increase in waste arising, there should be sufficient capacity to treat waste at the contracted facilities.

1.52 Although contracts have made provision to transfer risk to the private sector, none include a break-clause<sup>33</sup>. The Welsh Government has advised us that this is consistent with the majority of waste contracts across the UK. However, there are change clauses that would be invoked if the law changes. If a council or the contractor brings about a different change agreed by both parties, there would be a re-pricing.

1.53 The absence of break-clauses means that should new technologies become available, particularly in the case of residual waste, partnerships will not be able to take advantage of potentially more sustainable or better value-for-money solutions without significant financial penalties. Should private sector operators wish to upgrade their facilities they will bear the costs and potential risks.

1.54 Payment for waste treatment services starts on full contract commencement. In contrast, for three projects in England examined by the National Audit Office, the funding agreements required grant payments to start as soon as the private sector contractors began to provide services under the contracts, irrespective of whether all of the planned infrastructure had been delivered. This made it difficult for Defra to withdraw or amend its financial support for these contracts even when significant infrastructure had not been delivered as planned.

33 A break clause is a provision in a contract which enables either the contractor or the contracting body (or both) to end the contract early. It may arise on one or more specified dates or be exercisable during any time during the term (often after a specified period of time has elapsed).

## Part 2

Several councils opted out of the Programme and have their own arrangements, but some still need to find alternatives to landfill for the longer term



2.1 The Programme was voluntary and several councils opted out. These councils are not receiving a contribution to their gate fees from the Welsh Government for the treatment of residual or food waste. This part of the report explores why councils opted out of the Programme and describes the alternative arrangements that these councils have for the disposal or treatment of their residual and food waste. We have not audited the detail of these alternative arrangements as part of this review. As noted in [paragraph 1.15](#), six of the councils mentioned below have restarted a collaborative process to explore if there is now private sector interest to manage a residual waste facility serving South West Wales.

## Councils operating outside the Programme are generally incurring higher residual waste treatment costs and some are still reliant on landfill

- 2.2 **Wrexham County Borough Council** was well advanced in developing its own solution before the start of the Programme. In 2013, the Council signed a 25-year Private Finance Initiative waste management contract, which included a Mechanical Biological Treatment facility for residual waste with a capacity of 55,000 tonnes per year. The facility started to operate and to take the Council's waste in July 2015, and the contract will expire in March 2038. The gate fees for Wrexham's residual waste treatment facility are more than double the median cost of the residual projects under the Programme.
- 2.3 In March 2015, **Pembrokeshire and Ceredigion** councils signed a £48 million, 15-year framework contract with a private sector company to export their residual waste to overseas energy from waste facilities. Pembrokeshire was the lead council. The company processed the waste at Pembroke Dock and Lampeter to remove recyclable materials. The waste was then shredded, baled and wrapped at Pembroke Dock to create a Refuse Derived Fuel<sup>34</sup> and shipped to Scandinavia where it was used in high efficiency power stations to produce both electricity and heat for local households. The contract, which has since been cancelled ([paragraph 2.5](#)), was costing Ceredigion and Pembrokeshire less than disposing of the waste through landfill. However, it was higher than the median cost of the partnerships using energy from waste facilities under the Programme ([paragraph 1.41](#)). The councils believe they were paying higher costs due to the lack of economies of scale.

34 Fuel produced from various types of wastes such as municipal solid wastes, industrial wastes or commercial wastes.



- 2.4 In May 2017, Natural Resources Wales suspended the permit of the company Pembroke and Ceredigion councils were using to export their residual waste from Pembroke Dock. At the same time, gate fees increased in Europe, partly due to currency exchange rates. Although the company whose permit was suspended could have transferred the waste from the two councils to an alternative port with a permitted storage facility, the additional haulage costs and increased gate fees meant that Pembroke County Council viewed this option as financially unviable. Ceredigion County Council had favoured retaining the contingency arrangements until the permit could be reinstated as they believed this would be more cost-effective.
- 2.5 The contractor therefore put in place alternative contingency arrangements until the exporting arrangements satisfied Natural Resources Wales' permitting requirements. As this was not forthcoming, on 31 July 2018, Pembroke County Council terminated the contract for exporting residual waste. Ceredigion County Council is currently sending its residual waste to landfill. Pembroke County Council is sending its residual waste to landfill and to two UK energy from waste facilities.
- 2.6 **Carmarthenshire County Council** contracts with CWM Environmental, a council-owned company, to dispose of its residual waste. Until late autumn 2017, CWM Environmental transported some of Carmarthenshire's residual waste to the same company described above for exporting through Pembroke Dock, but under a separate contract. Following the suspension of that company's environmental permit, Carmarthenshire's residual waste is being sent to various energy from waste facilities around the UK, including a limited amount to Trident Park, Cardiff. Carmarthenshire County Council, through CWM Environmental, is currently discussing options for longer-term use of capacity at the Trident Park site.
- 2.7 Between April 2015 and May 2017, **Powys County Council** also diverted residual waste from its transfer station in Brecon for export through Pembroke Dock with the same private company described above but under a separate contract. The Council is currently disposing its residual waste at the Bryn Posteg Landfill Site in Llanidloes.

- 2.8 The process of exporting residual waste overseas did not comply with the European Union's requirements under the proximity principle. The proximity principle underpins the Welsh Government's approach to sustainable waste management. It means that waste should be disposed of or treated as close to the point of its generation as possible in order to reduce the environmental impact of transporting it and to ensure that those producing the waste take responsibility as far as possible for dealing with it. However, a study by consultants Eunomia for Pembrokeshire County Council found that the contract for exporting residual waste overseas had a lower carbon footprint and retained more money in the Welsh economy and created more jobs per £1 million spent than for some of the projects in the Programme.
- 2.9 Pembrokeshire County Council and Ceredigion County Council were two of the councils in south-west Wales facing issues with finding an alternative viable local solution (paragraph 1.14). Prior to awarding the contract for exporting residual waste overseas, Pembrokeshire County Council undertook an open procurement process on behalf of itself and Ceredigion County Council, but only received two bids from UK-based solutions, with the remaining five bids all being export based. The Council considers that this outcome reflected its geographical isolation and the very high road haulage costs compared with shipping costs to a port-based solution abroad. The tender had a strong emphasis on environmental benefits and the Council considered that the best environmental outcome was the export solution.
- 2.10 **The City and County of Swansea Council** currently sends its residual waste to Tir John Landfill, a site that it owns in Port Tennant, Swansea. The Council told us that it would seek a long-term solution for the disposal of residual waste after 2022, when it expects to send all residual waste to an alternative form of treatment. The Council says that to be able to close and to restore the Tir John landfill site, it needs to fill the remaining void capacity to create a suitable profile for the control of surface water. The view of the Council is that it should fill the void with residual waste, because in this way it will spend less than filling the remaining capacity with inert wastes and soils, as well as the additional costs of disposing or treating residual waste elsewhere. The Council considers that it can achieve this aim without exceeding its landfill allowance allocations to 2022.

- 2.11 **Bridgend** and **Neath Port Talbot** councils share the use of the Materials Recovery and Energy Centre at Crymlyn Burrows, Neath Port Talbot. Neath Port Talbot is the appointed 'Waste Disposal Authority' for Bridgend and the current appointment has nearly 11 years remaining. Neath Port Talbot County Borough Council owns the Crymlyn Burrows site, which is run by council-owned Neath Port Talbot (NPT) Recycling Ltd, a subsidiary of Neath Port Talbot Waste Management. The Council is currently in the process of winding-up the company and bringing the facility in-house to operate as a transfer station/depot only. Alongside this, a contract for the incineration of residual waste deposited at the Crymlyn Burrows site will be let at the earliest opportunity. Current gate fees are more than the median of the residual waste projects under the Programme.
- 2.12 The reason for the Programme was the need for councils to divert waste from landfill. However, some of the councils named above have reverted to using landfill as the primary method of disposing residual waste and with few plans yet to change. A few of these councils face a real risk of financial penalties if they fail to meet landfill allowance targets.

## There are five councils with food waste projects outside the Programme, but with similar median costs

- 2.13 There are currently five councils currently running food waste projects outside the Programme. At £55 per tonne, the median cost for these five projects is slightly less than those in Programme ([paragraph 1.38](#)). Most of these projects are using facilities with similar technology to the projects in the Programme:
- **Isle of Anglesey County Council** is using the same facility used by Gwynedd Council for Prosiect GwyriAD. However, the Council is using the facility through a 'working arrangement' rather than a formal contract. Conwy County Borough Council has also made some use of the facility<sup>35</sup>.
  - food waste in **Wrexham** is treated at the Wrexham Recycling Park through in-vessel composting<sup>36</sup> as part of Wrexham's PFI waste management contract.

35 Conwy County Borough Council is also part of the North East Wales partnership for food waste.

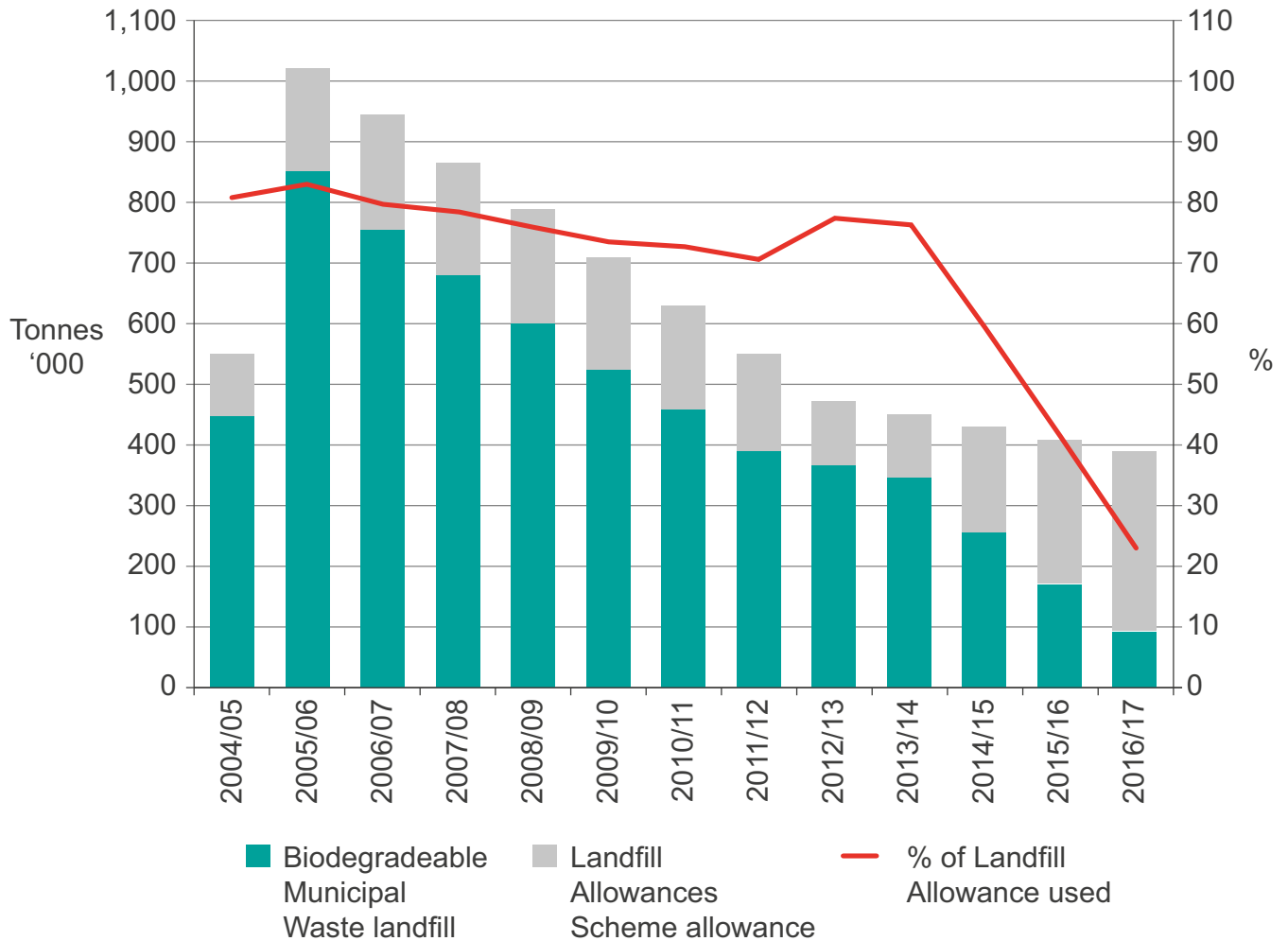
36 An industrial form of composting biodegradable waste that occurs in an enclosed aerobic bio-reactor in which airflow and temperature can be controlled.

- since May 2018, **Neath Port Talbot County Borough Council** transports its food waste to private sector anaerobic digestion facilities in Denbighshire and Rhondda Cynon Taf . The council was previously transporting food waste to a facility in Bristol.
- **Caerphilly County Borough Council** pulled out of the Heads of the Valleys project and disposes of its food waste in a private sector owned facility in the county.
- **Carmarthenshire County Council** uses a council-owned company to transport and dispose its food waste at an in-vessel composting facility in Nantycaws.

## The procurement of new waste treatment capacity has significantly reduced the reliance on landfill in recent years

2.14 Since 2005, the use of landfill in Wales has reduced by more than 50% (Figure 17). This is due to increasing levels of recycling, the development of energy from waste and food waste disposal facilities and the export of residual waste to other countries. This has meant that all councils in Wales are currently operating within landfill allowance scheme limits.

Figure 17 – disposal of biodegradable waste in landfill by Welsh councils from 2004-05 to 2016-17 shown against the percentage of Landfill Allowance used

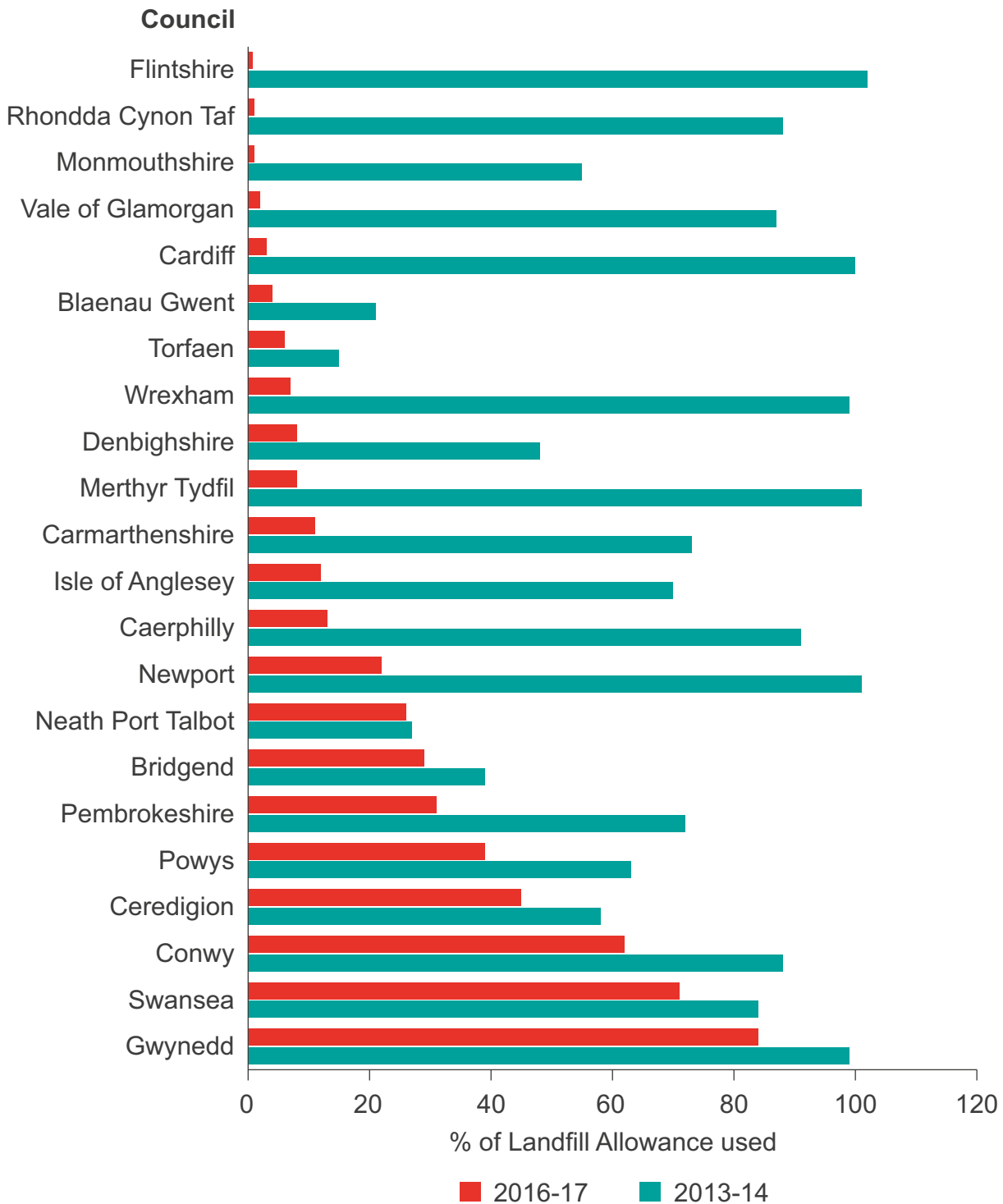


Source: Natural Resources Wales, **Report on the Landfill Allowances Scheme (LAS) Wales 2016/17**, October 2017

- 2.15 In 2016-17, Gwynedd used 84% of its landfill allowance and Swansea used 71% (Figure 17). The landfill allowance reduces each year. Gwynedd will soon start using the new residual waste facility in North Wales, which will see its reliance on landfill reduce, placing Swansea as the council most at risk from breaching its landfill allowance and incurring financial penalties. Natural Resources Wales, which monitors the landfill allowance scheme in Wales, stated that 'meeting the future targets up to 2020 will be particularly challenging for those local authorities that were close to exceeding their 2016-17 individual allowances'.
- 2.16 Natural Resources Wales recently reported to the European Commission that in 2016, there was approximately 23.5 million cubic metres of landfill capacity remaining in Wales. Natural Resources Wales calculates that this is enough for 11 more years based on current levels of input for all wastes including biodegradable, inert and hazardous waste<sup>37</sup> that cannot be treated or disposed by alternative methods. With the North Wales residual waste treatment facility due to become operational in 2019, the remaining capacity is likely to extend further.
- 2.17 Overall, across Wales there has been a significant reduction in the use of landfill allowance since 2013-14 (Figure 18), which was before any of the residual waste treatment facilities used under the Programme began operating. There has been a particularly marked decrease in councils' use of their landfill allowance in the Prosiect Gwyrdd and Tomorrow's Valley partnerships where there has been an average reduction of 64%, compared to 39% for councils not taking part in the Programme at the time.

37 Inert waste is waste that does not undergo biological, chemical, physical, or radiological transformation. Inert waste includes building (demolition) waste, gravel, sand, and stone but not any biodegradable, hazardous, or green (botanical) material. Inert waste typically requires lower disposal fees than biodegradable or hazardous waste.

Figure 18 – comparison of the percentage use of the landfill allowance for biodegradable wastes by councils in 2013-14 and 2016-17



Note:  
 2013-14 was chosen as a starting point because there was no energy from waste at this time.  
 Source: Natural Resources Wales, **Landfill Allowance Scheme (LAS) Wales report 2016/17**, October 2017

# Appendices

Appendix 1 – Audit methods

Appendix 2 – Waste Infrastructure  
Procurement Programme  
projects





# Appendix 1 – Audit methods

This report forms one of a set of three related pieces of work on waste management in Wales that will be published by the Auditor General for Wales. The other two pieces of work have considered issues relating to support for waste prevention and municipal recycling.

We reviewed the following documentation:

- Final Business Cases
- Business Case Reviews
- Welsh Government programme papers

We sought the views of:

- Welsh Government officials (including Local Partnerships officials seconded to the Welsh Government's Programme Office);
- Local Partnerships transactors (see [paragraph 1.5](#));
- Council representatives from all projects within the programme;
- Council representatives from all projects outside the programme; and
- Natural Resources Wales.

We obtained data from verified sources such as Statistics Wales Bulletins issued by the Welsh Government, and from Natural Resources Wales. We built in part on initial enquiries undertaken in response to correspondence received by the Auditor General for Wales in 2014 and 2015.

In addition, we researched papers published by the Waste and Resources Action Programme.

## Appendix 2 – Waste Infrastructure Procurement Programme projects

The programme consists of ten projects – seven food waste projects (15-year projects) and three residual waste projects (25-year projects). The projects were set up to procure capacity at waste treatment facilities run by the private sector. We have described projects as ‘reverting’ or ‘merchant’ facilities. At the end of the contract, the facility will either revert to the ownership of the lead local authority or remain under the ownership of the private sector operator. The facility capacity relates to the full capacity of the facility, which will not necessarily be all used exclusively by the councils involved in the project.

Three projects did not proceed beyond the initial early stages ([paragraphs 1.11 to 1.12](#)):

- a Central Wales residual project which was cancelled in the early stages of procurement due to lack of market interest;
- an initial South West Wales food waste project which was stopped in 2013 after the preferred bidder withdrew prior to signing the contract; and
- a South West Wales residual project which was cancelled during the early stages of the procurement due to lack of interest from the participating councils.

The tables below summarise the main information about each project.

### Food waste projects

Project name	Central Wales Waste Partnership
Council partners	Ceredigion Powys Pembrokeshire (from late 2016)
Facility and location	Agrivert facility Cassington, Oxfordshire (from May 2012 to late 2016). Reverted to Agrivert facility at Stormy Down, Bridgend which opened late 2016.
Reverting or merchant facility	Merchant
Commencement of service	01 November 2012
Facility capacity	48,000 tonnes per year
Heat and power capability	The gas turbine engines can generate over 3MW electricity, enough to power 5,900 homes. Biofertiliser is produced.
Additional comments	Pembrokeshire joined the contract after Ceredigion and Powys had procured their capacity and following the failure of the South West food waste project ( <a href="#">paragraph 1.11</a> ).

<b>Project name</b>	<b>Cardiff Organic</b>
Council partners	Cardiff Vale of Glamorgan
Facility and location	Dwr Cymru (Cardiff) operate the facility on the waste water treatment works, adjacent to the Tremorfa Industrial Estate, Cardiff.
Reverting or merchant facility	Merchant
Commencement of service	31 March 2017
Facility capacity	35,000 tonnes per year
Heat and power capability	The facility will generate around 1.5MW of electricity, which is sufficient to power more than 1,500 households.
Additional comments	The facility is also designed to generate sufficient power to support Dwr Cymru's adjoining sewage treatment operations and/or a low-carbon fuel district heating system in Cardiff. This has reduced the gate fee paid by the partnership.

<b>Project name</b>	<b>North East Food Waste Hub</b>
Council partners	Conwy Denbighshire Flintshire
Facility and location	Biogen Greenfinch Anaerobic Digestion Food Waste treatment facility, Rhuallt, St. Asaph
Reverting or merchant facility	Reverting
Commencement of service	1 November 2012
Facility capacity	22,500 tonnes per year
Heat and power capability	The electricity production at full output is 1060kW.

<b>Project name</b>	<b>Project GwyrAD</b>
Council partners	Gwynedd
Facility and location	Biogen plant at Llwyn Isaf.
Reverting or merchant facility	Reverting
Commencement of service	21 October 2013
Facility capacity	11,000 tonnes per year
Heat and power capability	The electricity production at full output is 499kW.

<b>Project name</b>	<b>Tomorrow's Valley (food)</b>
Council partners	Merthyr Newport Rhondda Cynon Taf
Facility and location	Biogen plant at Bryn Pica, Rhondda Cynon Taf.
Reverting or merchant facility	Reverting
Commencement of service	21 July 2015
Facility capacity	22,500 tonnes per year
Heat and power capability	The CHP will provide 1,100kW Plans to use heat for a eco-park on same site

<b>Project name</b>	<b>South West Wales</b>
Council partners	Swansea Bridgend
Facility and location	Agrivert facility at Stormy Down, Bridgend
Reverting or merchant facility	Merchant
Commencement of service	August 2017
Facility capacity	50,000 tonnes per year
Heat and power capability	3 MW of electricity
Additional comments	The project followed a failed procurement involving three more South West Wales councils in 2013 ( <a href="#">paragraph 1.11</a> ).

<b>Project name</b>	<b>Heads of the Valleys</b>
Council partners	Blaenau Gwent Monmouthshire Torfaen
Facility and location	Agrivert facility at Stormy Down, Bridgend
Reverting or merchant facility	Merchant
Commencement of service	April 2018
Facility capacity	50,000 tonnes per year
Heat and power capability	3 MW of electricity

## Residual waste projects

Project name	Prosiect Gwyrdd
Council partners	Cardiff Caerphilly Monmouthshire Newport Vale of Glamorgan
Facility and location	Viridor energy recovery facility at Trident Park, Cardiff.
Reverting or merchant facility	Merchant – ownership will not revert to the Partnership (or any of the councils) on contract expiry.
Commencement of service	1 April 2016
Facility capacity	425,000 tonnes per year
Heat and power capability	<p>The plant will generate 35MW and export 30MW of electricity, enough to power 50,000 homes.</p> <p>Early stage investigations are underway to explore the potential for a district heating system using the heat generated from the facility.</p>
Additional comments	<p>Prosiect Gwyrdd is the primary client and therefore guaranteed to pay the lowest gate fees of any local authority partnership using the facility as part of a long-term agreement.</p> <p>The full business case review concluded that the project was 'well managed and demonstrates significant cost savings for the Partners when compared with current and projected costs' and that it provides 'value for money for the public sector while complying with Welsh Government strategy in relation to waste management'.</p>

Project name	North Wales Residual Waste Treatment Project
Council partners	Conwy Denbighshire Flintshire Gwynedd Isle of Anglesey
Facility and location	Parc Adfer, on a former steelworks site at the Deeside Industrial Park in Flintshire, operated by Wheelabrator.
Reverting or merchant facility	Reverting - Flintshire County Council will retain ownership of the site at the end of the contract.
Duration of procurement	Six years
Commencement of service	Commissioning of services estimated for April / May 2019 with the facility forecast to be fully operational by September / October 2019
Facility capacity	200,000 tonnes per year
Heat and power capability	The plant will generate 17MW of electricity, enough to power 30,000 homes.  The facility will also produce steam which could be used to provide heat for adjacent homes and businesses.
Additional comments	The North Wales facility is the only residual waste facility that is a reverting asset. At the end of the 25-year agreement, ownership and responsibility for the facility will revert to Flintshire County Council which is the lead authority for the partnership. Provisions in the Inter Authority Agreement allow for the Partnership to decide what to do at the end of the contract.

Project name	Tomorrow's Valley (residual)
Council partners	Blaenau Gwent Merthyr Tydfil Rhondda Cynon Taf Torfaen
Facility and location	Viridor energy recovery facility at Trident Park, Cardiff
Reverting or merchant facility	Merchant
Commencement of service	Three years
Facility capacity	1 April 16
Heat and power capability	425,000 tonnes per year
Additional comments	<p>The partnership originally comprised of only RCT and Merthyr. Torfaen and Blaenau Gwent were attracted to the partnership and joined the contract because of lower than expected gate fees.</p> <p>Tomorrow's Valley partner councils are paying higher gate fee more than for Prosiect Gwyrdd because they are third party users and not the primary client.</p>





Wales Audit Office

24 Cathedral Road

Cardiff CF11 9LJ

Tel: 029 2032 0500

Fax: 029 2032 0600

Textphone: 029 2032 0660

We welcome telephone calls in  
Welsh and English.

E-mail: [info@audit.wales](mailto:info@audit.wales)

Website: [www.audit.wales](http://www.audit.wales)

Swyddfa Archwilio Cymru

24 Heol y Gadeirlan

Caerdydd CF11 9LJ

Ffôn: 029 2032 0500

Ffacs: 029 2032 0600

Ffôn Testun: 029 2032 0660

Rydym yn croesawu galwadau  
ffôn yn Gymraeg a Saesneg.

E-bost: [post@archwilio.cymru](mailto:post@archwilio.cymru)

Gwefan: [www.archwilio.cymru](http://www.archwilio.cymru)