RIIO-GD1 Business Plan 2013-2021

Part B7

Environment Strategy

This paper forms part of Wales & West Utilities Limited Regulatory Business Plan 2013 - 2021. Your attention is specifically drawn to the legal notice relating to the whole of the Business Plan, set out on the inside cover of The Executive Overview (Part A) of the Business Plan. This is applicable in full to this paper, as though set out in full here.

Except where stated to the contrary, all financial values within this paper are stated in 2009/10 prices, inclusive of 1% efficiency and prior to real price effects. This is in order that they match the figures used within the detail of the Business Plan Data Template.

This is a redacted copy. We do not indicate where material has been redacted.

Table of Contents

1. Introduction 2
2. Executive Summary 4
3. Environmental Strategy 6
4. Performance against our Strategy for GDPCR1 15
5. Outputs for RIIO-GD1 16
6. Innovation 19

1. Introduction

Wales & West Utilities (WWU) has a number of environmental interactions as part of our business as usual activities. These are outlined in section 3 of this document. Since our formation in 2005, we have actively sought to minimise the impacts in these areas for good business reasons.

The environmental debate has grown and matured. This has been reflected in views of how gas supports the long term energy mix in the UK. Sustainability is also a key feature of Ofgem's RIIO-GD1 business planning process.

The Redpoint[1] report on the future of gas, portrayed a number of potential scenarios for the use of gas up to 2050. What is clear from that document is that, if gas has a future, it is a sustainable future. That is, we must effectively manage our activities to place less of an environmental burden on the planet. This has also been clearly stated by a range of stakeholder engagements.

In order to put in place the methods by which we will manage our impacts into the future and through the RIIO–GD1 period of 2013 to 2021, we have developed this environmental strategy. This builds on our successes, but also reflects what we need to do to improve our environmental position, as guided by stakeholders. The strategy investigates all of our environmental impact areas, and then sets out the actions that we take to minimise those impacts. This is done by integrating the management of the impacts through the individual elements of the plan, as shown in the following table.

Output Group	Output Category	Business Plan Areas
Carbon Agenda	Methane Emissions – System Loss	Distribution mains & services Network Management (Below 7bar)
	Business Carbon Footprint	Fleet (including mobile plant) Supply Chain Environment Strategy
Land Management	Land Remediation	Environment & Land Management
Landfill, Waste & Natural Resource	Aggregate Extraction Spoil to Landfill	Environment Strategy
Renewable gas	Connection of distributed gas	Distributed Gas
Adapting to Climate Change	Adapting to Climate Change	Adaptation to Climate Change

[1] Available at;
http://www.redpointenergy.co.uk/images/uploads/ENA_gas_future_scenarios_report_v1.1_FINAL.PDF

The purpose of this paper is primarily to demonstrate that the management of environmental performance and risk has been constructed from a strategic perspective, and is also intrinsically embedded within our business operations.

These individual investment plans set out the stakeholder focused and output led action for the RIIO-GD1 price control period. They also summarise the facts, risks and investment drivers as well as the current period from 2008 to 2013 investment and our methodology for determining future intervention strategy.

To support the whole process, external consultants were engaged and a summary of their main conclusions are included within this paper.

Where there are specific environmental outputs not directly connected with other investment plans, these are included within this paper:

Section 3. outlines our strategic approach to the Environment.

Section 4. identifies the performance achieved through the current GDPCR1 2008/13 period.

Section 5 identifies what the application of the strategy is intended to achieve in the RIIO-GD1 period of 2013/21.

2. Executive Summary

The environmental agenda, whilst always important to WWU, has had its profile raised through a number of key associations:

- The long term future of gas distribution will require a number of sustainable interventions, such as the connection and use of renewable gas from sources such as anaerobic digesters and landfill sites.
- The greenhouse gas agenda, and government targets for the reduction of carbon dioxide sources.
- The general societal requirements for a green agenda.

All of this is reflected in Ofgem's RIIO–GD1 business planning requirements.

We acknowledge that, as a major infrastructure provider, we have a significant role to play in minimising our environmental impact. WWU's environmental performance has continually improved, as reflected by our performance since 2008/09, which includes in this review period:

- No significant environmental incidents or prosecutions and successful retention of ISO 14001[2] certification.
- Gas leakage reduction of 12% from 579,000 tonnes $C0_{2e}$ to 507,000 tonnes for 2012/13.
- Circa 750 Vehicles replaced with those having more efficient engines and speed restrictors.
- Less than 20% of our excavated spoil sent to landfill.
- Improved use of recycled aggregates for backfilling excavations.
- Hazardous Solid Waste reduced from 11,000 to 3,000 litres.
- Carried out site remediation at 22 sites and investigated over 40 sites.

As environmental requirements become more stringent, we have responded by:

- Consulting stakeholders on their requirements.
- Engaging with specialist advisors on a number of subject areas.
- Developing this environmental strategy which has been done by identifying our environmental touch points and by building on our current approach and,

Stakeholders gave us the following feedback during the consultation process:

- Reducing gas leakage was considered a top priority and there was general consensus that this should be WWU's main environmental focus.
- There was no support for an increase in consumer bills to fund additional environmental initiatives.

[2] ISO 14001 is an internationally accepted standard that sets out how you can go about putting in place an effective Environmental Management System (EMS). The standard is designed to address the delicate balance between maintaining profitability and reducing environmental impact.

- It was widely agreed that increasing the proportion of gas from renewable sources should be a priority and should be encouraged.
- It was not felt that the cost of connecting renewable sources should be passed on to consumers in general. The connection should be funded by those benefitting from the connection.

Following that feedback, the key aspects of our future plans are to deliver the following outputs during RIIO-GD1:

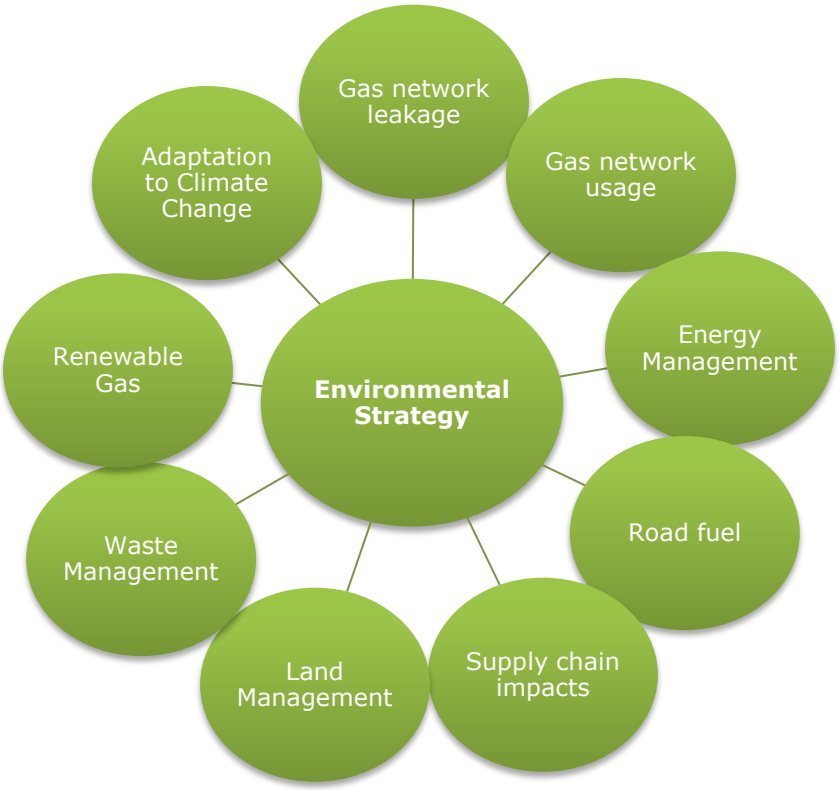
- Reduce leakage emissions by 16% from 2012/13 levels.
- Reduce our other business carbon footprint emissions by 10% from 2012/13 levels.
- Remediate 22 contaminated sites.
- Reduce our extraction of aggregates by 4%. from 2012/13 levels.
- Decrease the excavated spoil going to landfill by 4% from 2012/13 levels, and
- Have no ISO 14001 non conformities or prosecutions.

3. Environmental Strategy

WWU's environmental strategy has been formulated by identifying and quantifying our environmental impacts, and then by consulting stakeholders for their views of where we should take priority action.

3.1. Environmental Impacts

The following diagram shows WWU's impact areas.



These impact areas break into business carbon footprint areas such as:

- Leakage of methane from the gas assets – this is our primary greenhouse gas impact with circa 96% of our total tonnage of carbon dioxide equivalent (CO_{2e}).
- Own gas usage – the gas that we use in reducing pressures through the gas network by pre heating gas to prevent its temperature falling to unacceptable levels.
- Energy usage in the electricity and gas that we use in our operational and non-operational facilities.
- Road fuel usage largely through the circa 800 commercial vehicles that we deploy, and through the use of circa 200 company cars.
- The carbon footprint of our significant supply chain service and goods providers. This is in a number of areas, including the energy used by some of our primary materials providers, for example, the polyethylene pipe that we use, and also the road fuel used by first tier service providers in delivering our goods and services.

And also non carbon impacts, such as:

- The amount of excavated materials that we take to landfill sites and the amount of virgin aggregates that we use. These are impacted by the excavation techniques that we deploy, for example we use insertion techniques for over 90% of our significant mains and services replacement programme, and the level of recycling that we are able to utilise.
- How we manage our portfolio of operational and ex operational sites, many of which are contaminated through use as town gas production sites prior to WWU existence.
- The minor amount of hazardous and general waste that we generate through our activities, and here there are further supply chain opportunities.
- How we deal with the connection of renewable gas, to make the process as easy as possible for developers.
- We also focus on the potential impact of climate change on our gas assets, and non operational properties.

Our strategy is to consider all of these, and to plan to reduce the environmental impact where we can, providing that it is cost effective.

Our performance against this strategy for RIIO-GD1 2008/13 is shown in section 4 of this document, and our future plans are shown in section 5.

3.2. Systematic approach

Our environmental strategy is the subject of ISO 14001 certification which we have had in place for a number of years, and that we are developing as environmental legislation, and societal requirements move forward.

3.3. Stakeholder Engagement[3]

The RIIO–GD1 process has an expectation that key stakeholders are identified and consulted on our plans for the future 2013/21 period. Whilst WWU has always consulted with stakeholders, and environmental stakeholders are no exception, our business planning process has engaged with a broad range of stakeholders to help in the formulation of our proposals.

In respect of our general actions to consult stakeholders, a number of stakeholder engagement workshops were conducted during 2010 and 2011.

We also have frequent discussions with regulators from both the Environment Agency and Local Authorities. These are primarily, but not exclusively, in relation to the contaminated land management strategy. Both these Regulators are directly involved in verification of our remediation projects to confirm that, based on their assessment at the time; our sites no longer represent a risk to the environment or controlled waters. Additionally, The Energy Saving Trust and Envirowise[4] have also been consulted during 2010 and these are referred to in subsequent sections.

[3] Part B5 – Stakeholder Engagement

[4] Energy Savings Trust and Envirowise offer energy savings and waste management advice respectively

Generally the following high level feedback was received relating to the environment:

- Reducing gas leakage was considered a top priority and there was general consensus that this should be WWU's main environmental focus.
- There was no support for an increase in consumer bills to fund further environmental initiatives.
- It was widely agreed that increasing the proportion of gas from renewable sources should be a priority and should be encouraged.
- Environmental regulators support our ongoing active environmental management and demonstration of compliance.

Generally, there was a favourable response to WWU's proposals for environmental impact reductions, providing that value for money was also a consideration.

3.4. Business Carbon Footprint

In accordance with Ofgem's RIIO- GD1 decision document published in March 2011, we will continue to work with the other GDN's to produce a standard reporting template for annual reporting of agreed carbon scope 1 & 2 emissions that we have full operating control over and an identified subset of scope 3 emissions (business travel & external contractors).

WWU commissioned an external consultancy to conduct a review of current and projected environmental performance and provide an updated snapshot of WWU's Business Carbon Footprint (BCF) for the baseline years 2009/10 and 2010/11. They concluded that WWU Greenhouse Gas inventory has been carried out in a robust and comprehensive manner in compliance with World Resources Institute (WRI) Standard Practice norms and exceeding Ofgem reporting requirements for RIIO-GD1.

Our carbon footprint is indicated by the following table.

Ref	Emission Scope Category	Emission Source	Estimated BCF 2010-11 (tCO_2e)
1	1	Energy Consumption	2,600
2	1	Company Transport	9,000
3	1	Fugitive Emissions	De-minimis
4	1	Leakage	539,000
		Total Scope 1	**550,600**
5	2	Purchased Electricity	3,100
		Total Scope 2	**3,100**
6	3	Business Travel	100
7	3	External Contractors	8,800
		Total Scope 3	8,900
Total Standard BCF Including Leakage (Scope 1 &2)			**553,700**
Total BCF Excluding Leakage (Scope 1&2)			**14,700**
Total BCF (Scope 1, 2 &3)			**562,600**

3.4.1. Leakage – 539,000 tonnes CO_{2e}

Our carbon footprint is dominated by leakage from old and deteriorating metallic pipes. From the table above (2010/11), circa 539,000 thousand tonnes of CO_{2e} of our total of 562,999 tonnes (96%) is from this source. Apart from the impact on our carbon footprint by the methane lost, and methane has a greenhouse gas impact of circa 21 times carbon dioxide, there are also the risks posed to the public from potential gas explosions.

Our primary activity in minimising our carbon footprint is in respect of network leakage.

3.4.2. Energy consumption and purchased electricity– gas 2,600 tonnes CO_{2e}, electricity 3,100 tonnes CO_{2e}

Our gas consumption includes the gas that we use in the pressure reduction process, and the gas that we use in space heating. We use gas in our higher pressure reduction facilities to pre heat gas, so that when gas usage is high and ambient temperatures are low, gas does not fall below the freezing point of water. If this was to happen, then water from the atmosphere would freeze and damage pipe lines and control equipment. We have undertaken programmes of gas pre heater changes through GDPCR1, where a secondary benefit is the reduction of gas used. We propose to continue this programme through RIIO-GD1.

The gas and electricity that we use at our operational and non operational sites, save for the gas that we use for pre heating mentioned above, form the subject of our energy strategy. This breaks into a commercial strategy for reducing WWU's expenditure on energy, and an environmental strategy for reducing the Business Carbon Footprint of energy usage. In most cases, the actions taken are synonymous across both elements.

- Procurement – we procure in bundles to mitigate financial risk, but at the same time, consider the purchase of green energy as part of the portfolio. We use specialist industry advisors to assist in this process.
- Measurement of energy – we have committed to the purchase of electricity automated meter reading equipment to provide accurate and timely electricity usage readings at our top usage sites On the completion of this installation programme, we will decide whether to extend it into gas usage, and/or further electricity sites.
- Bill scrutiny – WWU utilises the services of a specialist energy company to scrutinise the bills received from energy suppliers. This process will be enhanced by the use of automated meter reading. Billing scrutiny identifies, for example, where higher than expected usage is present.
- Energy Audits - we plan to carry out energy audits at higher usage sites.
- Carbon Reduction Commitment scheme – whist we do not exceed the current threshold for entry into this scheme, if we should there would be an impact on gas consumers for the tax levied under this scheme. We are keeping this under review and plan to mitigate the impact by energy conservation measures. This is referenced in Part B4 - Business Plan Uncertainties.
- Employee engagement – we plan to use employee engagement to reduce energy usage at key sites.

- Investment requirements – energy reduction may require investment, e.g. photo voltaic sites, further metering equipment, energy efficiency works. The guidance given by stakeholders is that they would not wish to see the cost of environmental benefits passed onto bill payers, so any actions that we take must pass a whole life cost benefit case analysis.

3.4.3. Emissions from road fuel – 9,000 tonnes CO_{2e}

Our road fuel emissions are heavily influenced by our work load, large geography and terrain, and in meeting our standards of service in remote and/or rural areas.

Our activities to minimise the impact of road fuel emissions are detailed further into this plan, but will cover the replacement of our commercial fleet already partly undertaken with EuroIV compliant vehicles, progressively towards EuroV standard vehicles, and actions to limit the emissions from our company car fleet. We also intend to investigate the innovative use of compressed natural gas as a road fuel, and also other technologies. This is outlined within our Innovation Strategy in part B3 of our Business Plan.

3.4.4. Supply chain activities – 8,800 tonnes CO_{2e}

Our supply chain contributes a considerable element to our carbon footprint and other impacts. Our Supply Chain strategy identifies our standardised approach to ensuring that we minimise the environmental impact of the supply chain. Key elements of this have been:

- We have engaged with our principle supplier of polyethylene pipe to understand the wider impact of the use and eventual disposal of their products and the impact on the environment. Our future activities will include investigating the use of thinner walled pipe to reduce the impact on both energy consumption and waste minimisation.
- Actions within the supply chain, for example on the fuel used by our tier one contract partners, and through our contracted logistics activity.

3.5. Other environmental impacts

3.5.1. Excavated materials

A significant element of our environmental impacts are associated with our works programmes for mains and services renewals, reinforcement to deal with increased capacity demands, new connections and repairs following gas escapes. Going forward, our work plans indicate that we will excavate over 300,000 tonnes of materials per year. We consider every opportunity to re-use or recycle excavated materials on a project by project basis and consistently work towards solutions that either remove the need for excavations in the first place, or significantly reduce them. Improved planning support and improved techniques including insertion methods, thrust boring, directional drilling, and vacuum excavation techniques have been employed. The result has been that we have kept the production of excavated spoil to a minimum and realised additional sustainable and societal benefit, especially in relation to the impact on local communities, traffic, habitats and landscapes.

3.5.2. Extraction of Aggregates

Reducing our reliance on imported and natural products has been a target and objective for us since formation. We fully realise that, potentially, we can do more and we will continue to work with local Highways Authorities in particular on their policies in relation

to the use of alternative products, and the supply chain on quality issues and the availability of recycled products in many rural areas.

We recognise that further reducing our reliance on the use of quarried material is a key continual improvement area for us (and the wider utility industry). During 2010 and in collaboration with one of our primary contractors we completed a review into the costs associated with landfill, quarried aggregate and recycled materials to establish whether economic and social benefits could be realised.

The conclusions from this review demonstrated that introducing a policy to increase the use of recycled aggregates across our total operating area would result in costs increasing by as much as 100% at some locations – primarily due to the extensive additional transportation costs involved. This equates to an increase of c£10 per tonne on average across our operating area, taking typical costs from £15 to £25 per tonne and increasing our 2009/10 volume costs from circa £0.7m to £1.2m. Based on the feedback from our stakeholder engagement process, this increase would not have been supported.

3.5.3. Hazardous Waste

The disposal of hazardous waste associated with our normal activities has also decreased to levels that are considered as low as can reasonably and cost effectively be achieved. Hazardous waste is a by product of some of the sealant, paints and other materials used during both our current and historic activities, and this includes small volumes of asbestos.

We have been focusing on site awareness, dedicated segregation, product re-evaluation and collaboration with our waste contractors to reduce the hazardous waste. We will continue to explore opportunities to maintain and where economically viable reduce the production of hazardous waste volumes into the RIIO-GD1 period 2013-21. However this is directly related to workload and the actual waste generated from specific projects such as online pipeline surveys and the management of asbestos that have the potential to impact our year on year performance significantly.

3.5.4. Waste Generation

During 2011, we commissioned an Envirowise survey to establish an external independent opinion of our current general waste practices and to highlight any improvement opportunities.

The Envirowise survey team recognised our past achievements especially over such a large geography. They identified that ongoing behavioural change and support was a key indicator to future success in reducing volumes and that there are opportunities for recycling and potentially food waste from our major office site although this was estimated at only 4.8 tonnes per annum.

Recent initiatives from within our logistics contract and new contract arrangements within metering will support their findings and continue to drive reductions in general waste overall, especially cardboard, as suppliers are being contracted to remove waste associated with their own products, rather than WWU dealing with them as has historically been the case.

3.5.5. Land Management

In order to deliver the outputs for land remediation and management, we are continuing to take a risk based approach to investment decisions. Existing site specific data has

been used by external specialist consultants to grade the risk status of sites. Those deemed by professional engineering judgement as a priority for statutory remediation will follow WWU's land management decision tree for action to mitigate risks.

3.5.6. General supply chain involvement

Minimum environmental standards are already in place for suppliers, but these will be reviewed and expanded to enhance the green credentials of the WWU Supply Chain. Decision criteria and minimum weighting for tenders will also be introduced. The introduction of a WWU environmental policy will also provide opportunities for reducing the environmental impact of WWU business activities.

WWU is committed to integrating environmental considerations into its procurement activities. We will use our purchasing power and sourcing process as a means to meet our environmental and sustainable goals.

As an example, we have worked with our primary supplier of polyethylene pipe and will continue to do so during the RIIO-GD1 period 2013-21. Collaboration with this supplier and our first tier work delivery contractors has also seen the successful implementation of a sustainable re-use & recycling policy, whereby unused PE pipe can be reclaimed and beneficially returned for use in a safe and fully compliant manner.

This scheme has been implemented alongside behavioural change coaching and has resulted in our volumes of PE pipe that no longer have any further operational use being reduced to circa 5%. This unusable pipe is collected by the supplier for recycling at the same time as new supplies are delivered thus saving on road haulage.

We have also worked with our new logistics & delivery contractor to deliver improved and reduced mileage delivery schedules and to introduce a recovery scheme for wooden pallets and cardboard.

3.5.7. Renewable Gas

The Redpoint document prepared for the Energy Networks Association identified a number of scenarios where gas distribution in the longer term depended on the use of distributed gas. A number of the sources of distributed gas are from renewable sources, such as from bio digestion and landfill sites. We are committed to making the process of connecting distributed gas as easy as possible for potential developers.

To do this:

- We are chairing the industry collaboration group facilitated by the Energy Networks Association.
- We are actively engaged with the market to facilitate and enable connections in a cost efficient and market beneficial way. We have received a number of enquiries from potential producers and are developing processes which will develop into a repeatable, coherent and user friendly mechanism.

3.5.8. Adaptation to Climate Change

The UK Government has introduced a series of UK Climate Projections referred to as UKCP09[5]. These projections provide climate information for UK up to the end of this century, based on simulations from climate models. This information provides guidance

[5] Available at; http://ukclimateprojections.defra.gov.uk/

on how to help society and the natural environment by planning efficiently to minimise the impact of climate change.

We have used the likelihood forecasts from our Adaptation to Climate Change risk assessment, in line with UKCP09 models, to determine the future extent of climate change impacts. The process for calculating these likelihoods has been verified by the Department of Environment, Food and Rural Affairs and the output of this model identifies the degree of impact for individual climate change risks. This allows us to quantify the relative number of assets that are forecast to be impacted in the future.

We have developed a decision support tool to identify future action points where climate change risks become unacceptable. Adaptations can then be implemented in advance of these risks escalating to unacceptable levels, ensuring the potential for climate change impacts are controlled.

3.6. Reporting

WWU commissioned an external consultancy to conduct a review of the current and projected environmental performance and to provide an updated snapshot of WWU's Business Carbon Footprint for the baseline years 2009/10 and 2010/11. They concluded that WWU's current and projected performance was robust and that overall the WWU Greenhouse Gas inventory has been carried out in a comprehensive manner.

4. Performance against our Strategy for GDPCR1

This section should be read in conjunction with the strategy defined above for each areas outlined in the previous section for environmental impacts.

The following table lists the outcomes that were either delivered, or are planned to be delivered with a high confidence of success in the current period (2008-13).

Output Description	Current Price Period (2008-2013)
Gas leakage	Reduction of 12% from 579,000 tonnes $C0_{2e}$ to 507,000 tonnes for 2012/13
Energy consumption	We have committed to the purchase of electricity automated meter reading equipment to supply electricity data at 281 of our top energy usage sites, those where the electricity bill is >£500 per year. We will also determine whether there is merit in installing photo voltaic panels on a number of our sites.
Road fuel	Replacement of the majority of WWU's circa 800 strong commercial vehicle fleet of vehicles with Euro IV or Euro V compliant ones Replacement of a number of heavy goods vehicles with Euro V compliant Reduction of 300-400 Tonnes CO_{2e} per year
Supply chain activities	Engaged our primary supplier of polyethylene pipes on the supply, installation and recycling of polyethylene Engaged our logistics partner to deliver improved and reduced mileage delivery schedules with a potential to save circa 117 tonnes CO_{2e} each year and to introduce product recovery schemes
Excavated materials	Less than 20% of our excavated spoil sent to landfill
Extraction of aggregates	Improved use of recycled aggregates for backfilling excavations
Hazardous waste	Hazardous Solid Waste reduced from 11,000 to 3,000 litres per year
Land management	Overall we are actively managing circa 130 contaminated sites of which we have investigated over 40 sites and carried out statutory remediation on 22 sites
Renewable gas	We have commenced the process of determining the resolution of issues and establishment of process through chairing the ENA facilitated industry group on Distributed Gas – renewable gas is a subset. We have also engaged with a number of renewable gas developers including a major regional water company on potential projects.
Adaptation to climate change	During this period from 2008 to 2013, WWU will have installed flood defences at five sites and forecasts to undertake three pipeline replacements in river beds.
ISO 14001 system	No significant environmental incidents or prosecutions Successful retention of ISO 14001

5. Outputs for RIIO-GD1

Progressively over the period 2013/21 we will see an improvement in all environmental impacts:-

- **further reductions in our Leakage levels driven by the mains and services replacement programme.**
- **Business Carbon Footprint reduces as we further manage our energy needs and the impact of road fuel.**
- **The risk levels in respect of contaminated land reduces through remediation and inspection.**
- **The level of aggregate extraction and spoil to landfill is totally driven by the size of the work programme, but will be managed through the application of best practice techniques at individual project level.**

5.1. Introduction

The following are the outputs that we are proposing to deliver for the period 2013/21 with the actions that we propose to take to deliver the outputs.

5.2. Business Carbon Footprint – Shrinkage

Output Ref	Output Description	10/11	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EP1	Emissions due to network leakage (GWh)	450	415	407	399	390	382	374	365	357
EP1	Emissions due to network leakage (thousand tonnes C02e)	539	497	487	478	468	458	448	438	427
EP1	Gas lost through Shrinkage (GWh)	472	440	432	424	415	407	398	390	381

These outputs will be achieved by:-

- Mains Replacement Programme
- Proactively managing network pressures and maximising network management opportunities, albeit on a marginal basis due to the improvements already made.

5.3. Business Carbon Footprint Non-Shrinkage

Output Ref	Output Description	10/11	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EP2	CO2 emissions – other (excluding leakage) ('000 tonnes C02e)	22	20	20	19.5	19.5	19	19	18	18

These outputs will be achieved by:

- Replacement of our entire commercial vehicle fleet with EuroV compliant vehicles.

- Installing Automated Meter Reading equipment to enable us to better manage our electricity consumption and with a potential to extend into gas consumption.
- Focussing on our most energy intensive sites, with the potential to invest in photo voltaic generation, or energy efficiency measures, subject to the stakeholder requirement of cost efficiency.
- Working with our supply chain to minimise their environmental impact.

5.4. Land Remediation

Output Ref	Output Description	10/11	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EP3	Sites routinely monitored & maintained (statutory)	24	6	9	8	9	8	9	8	7
EP3	Sites remediated to low risk (statutory)	3	1	2	9	3	1	2	1	3
EP3	Sites remediated for commercial reasons	0	0							

These outputs will be achieved by:

- Adopting a proactive approach to land management utilising innovative techniques.

5.5. Volumes of aggregate extraction and spoil to landfill

Output Ref	Output Description	10/11	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
EP4	Volumes of Aggregate Extraction ('000 tonnes)	Not reported	141	141	140	139	139	138	138	136
EP5	Spoil to landfill ('000 tonnes)	Not reported	71	71	71	70	70	70	70	68

These outputs will be achieved by planning to minimise the levels of materials excavated in the first place, and then seeking to maximise the level of recycling so that we take the minimum amount to landfill, and extract the minimum level of virgin aggregates:

- Continuing to seek the most appropriate solution at a project level, by considering insertion methods, thrust boring, directional drilling, and vacuum excavation techniques.
- Continuation of our objective to reduce our reliance on imported natural products by working with local regulators (such as Highway Authorities) to permit innovative approaches to recycling.
- Working with partners to reduce the costs of recycling.

5.6. General waste

Output Description	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
General waste Management Tonnes per annum	820	800	780	760	740	720	700	700

This output will be achieved through operation of our ISO 14001 system and general management activity, supported by procurement action to minimise the level of potential waste materials received, and those that we can recycle, e.g. polyethylene pipe.

5.7. Renewable gas – as part of a broader distributed gas requirement

We will report on the capacity of distributed gas connected to the WWU network, as well as reporting against a voluntary set of standards for responding to connections enquiries.

5.8. ISO14001

Output Ref	Output Description	10/11	13/14 – 20/21
EP6	ISO14011 Major Non-conformities	0	0

These outputs will be achieved by:

- Ongoing compliance with legislation and continual improvement will underpin our success.
- Innovative integrated management system delivery in conjunction with our PAS55 certificated asset management system.

6. Innovation

As mentioned previously in this document, WWU engaged a specialist environmental consultant to review WWU's environmental position, and its proposals for the future RIIO-GD1 period. Part of the review incorporated an indication of Marginal Abatement Costs (MAC) as an indicator of the net cost or benefit per ton of CO_2 saved, over the life of a project. Additional analysis based on asset life, annual tCO_2e potential savings and investment required over the life cycle completed the analysis.

Based on all the analysis, the following table summarises those projects that were short-listed in terms of their overall performance on Profitability Index, Annual Carbon Savings, Internal rate of return and Applicability of Environmental Emissions Incentive. The rankings indicated that Pressure Management schemes emerged as the strongest candidates for implementation because over their life, they score well on all four indicators and offer by far the most favourable investment against tonnes CO_{2e} saved over the life cycle. WWU's comments against each of these suggestions are included within the right hand column.

Project	Primary Driver	WWU Comment
Existing pressure management	Leakage Optimisation	Already built into WWU Investment Committee Business Case submissions and decisions.
New pressure management	Leakage Optimisation	Already built into Asset Investment Plans.
Automated Meter reads	Emission Saving & Data Capture	To be installed during 2011/12
Onboard vehicle power packs	Emission Saving	This will not be taken forward at this time due to significant operational considerations that have not changed since the initial decision to introduce on board power in the first place.
SOLAR PV	Emission Saving	Third party funding model recommended however WWU needs to first identify a suitable third party (ESCO) or 'tenant on the roof'
TURBO-EXPANDER I	Emission Saving	This will not be taken forward at this time due to significant limitations on the WWU Network.
Energy efficient buildings	Emission Saving	To be considered during 2011/12
Bio methane fleet vehicles.	Emission Saving	WWU current strategy recognises the need for collaboration, and decisions regarding choice of vehicle and fuel(s) will be made during the period to reflect the best available technologies, infrastructure and cost efficiency at the time.
TURBO-EXPANDER II	Emission Saving	Due to financial risks and funding uncertainties, Turbo-expander II has been discounted.

Due to the evolving position of technology, incentives, infrastructure and general financial climate, WWU will continue to review its environmental strategy and objectives throughout the next price control period, to ensure we are reflecting the current national and regional position at the time.