

Initiatives which reduce the environmental impacts of gas distribution

We care about the world around us and believe that we have to reduce our environmental impact and develop sustainable methods of operation. Sustainable operations make good business sense and stop us damaging our environment while also reducing our operating costs and ultimately benefiting our customers.

We don't have all the answers but we believe our targeted five-year environmental plan is a good start. We have highlighted some of the plan contents in the supplementary information and have detailed below our two most significant environmental challenges in 2008/09, namely reducing emissions to air and emissions to land. We have also worked diligently to refine our leakage model to improve our understanding of the impacts of shrinkage and better target our condition replacement works to reduce emissions.

Emissions to Air

Our largest environmental impact relates to natural gas shrinkage.



Some 95% of our shrinkage relates to leakage from our low pressure distribution networks. With natural gas being lighter than air, leaking gas climbs into the atmosphere to become a greenhouse gas. Methane is the main component of natural gas and is approximately 21 times more pernicious a greenhouse gas than carbon dioxide.

We are committed to reducing our level of shrinkage and minimising our emissions to air. In 2008/09 we exceeded our target of a 2% reduction of natural gas emissions from our networks. This target was achieved by optimising operating pressures in our gas networks and by replacing our ageing metallic pipes with new polyethylene pipes. Additionally, we refined our leakage model to more accurately monitor shrinkage levels and influence future strategies.

Reducing emissions

We introduced a number of initiatives to reduce our emission of natural gas to air.

Our Condition Review Group identifies distribution mains which have higher than average leakage histories that are causing operational and environmental issues. Last year, we replaced over 50km of high leakage mains, which resulted in the reduction of 10,000 tonnes of CO₂ equivalent emissions to the atmosphere.

When undertaking risk-based mains replacement programmes in an area, our planning engineers check the escape history for all adjacent pipes to determine if they should be replaced in conjunction with the at risk mains.

Our Operations Plan identifies all of the gas distribution networks within our ownership. The objective of the Plan is to ensure that we operate each of our networks at the lowest practical pressures throughout the day and throughout the year. Leakage from gas networks is directly proportional to the operating pressure and therefore by reducing the pressure in our pipes we reduce our emissions.

Approximately half of our networks have sophisticated computer controlled pressure management

systems in place to constantly adjust and minimise the operating pressure. In the remaining networks it is not economically viable to install these control systems. We therefore optimise pressures by providing our field-based operatives with an Operating Plan that details the minimum pressure setting for the appropriate demand level. This results in our teams fine-tuning the pressure settings each time they visit one of our district governors.

The above actions, along with our on-going mains replacement programme has seen us reduce our carbon footprint by 75,000 tonnes of CO₂ equivalent in 2008/09.

Leakage Measurement Model

To ensure that our leakage measurement model is as accurate and reliable as possible, we undertook a major data cleansing programme in 2008/09, reviewing all our asset records. Utilising a variety of innovative techniques, including a specially-commissioned contractor accessing World War II aerial photographs, we have been able to more accurately differentiate between spun cast and pit cast iron pipes. This has resulted in updating 16,000 pipe records in the leakage model between spun and cast iron as well as identifying previously unrecorded assets.

Emissions to Land

In previous years, 500,000 tonnes of excavated spoil was generated annually as we carried out our mains replacement, maintenance and connection activities. Typically, 400,000 tonnes of spoil was disposed to landfill and excavations in roads and footpaths reinstated using aggregates sourced from quarries. Clearly these methods were not environmentally sustainable and we have now made radical changes to the way we deal with reinstatement.

In 2008/09 we set ourselves the challenging target of reducing the volume of excavated spoil going to landfill to less than 50% of total spoil generated. To meet this target we have adopted a "Reuse and Recycle" approach which has resulted in the quantity of spoil going to landfill reducing to 185,000 tonnes. This key target is monitored by the SGN Executive on a monthly basis and is widely communicated within the business using the in-house newspaper, intranet and by monthly face-to-face SHE updates delivered by operational managers to our workforce and partner contractors.

"SGN has championed the use of recycled reinstatement materials in the utility contracting community and are leading the way on reducing the environmental impact of its daily operations."

Charles Morrison
Morrison Utilities Services – Chief Executive

Lack of recycling centres

In April 2008, we appointed a Reinstatement Recycling Manager to work exclusively on reducing excavated spoil going to landfill and increasing the use of recycled reinstatement materials. The first task was to work with a number of national and regional recycling companies to develop a network of recycling centres in strategic locations throughout our operating area. We seek to have a recycling centre within a 30 minute journey time for 80% of our operational network. This ensures that spoil recycling can be efficiently undertaken on an ongoing basis and will not impact on the productivity of operational teams.

We have also taken a lead role with WRAP (Waste Resource Action Programme) the UK government-funded body with responsibility to reduce waste and increase recycling. We have contributed to a number of workshops at WRAP events in 2008 and have formed working partnerships with Thames Water and Scottish Water to stimulate the utility market for recycled reinstatement materials.

Twenty-two accredited recycling centres have been established throughout our networks and these are being used to recycle our waste on a daily basis. Additionally, all our contracts involving roadworks now require our contractors to adopt the use of recycled materials and to use the network of recycling centres. Using local recycling centres instead of landfill sites and quarries has reduced the distances travelled by our 100 vehicle reinstatement fleet by 700,000 miles per annum, reducing CO₂ emissions to atmosphere by 1,000 tonnes.

Reuse

Where possible, we segregate spoil on site using our own teams or partner contractors and where suitable it is reused to partially backfill the excavation. This is highly efficient and avoids unnecessary journeys by fuel-thirsty HGV vehicles. It also benefits the general public by helping to speed up the reinstatement process. 100,000 tonnes of spoil has been recycled on site in 2008/09.

Recycle

Analysis showed us that there were two major barriers to successful large-scale recycling of reinstatement spoil; a lack of recycling centres and variable quality of recycled materials.

"SGN has been the lead organisation in the Scottish Utility sector driving forward environmental and recycling initiatives."

Nigel Holmes
NISP - Director

Quality of recycled materials



Recycled materials must conform to the HAUC (Highway Authorities and Utility Committee) specification to be used to reinstate roads and footpaths. They must perform to the same high standards as quarried materials if they are to be successfully integrated into our operations.

To assess the quality of recycled materials on offer, we undertook a comprehensive field trial. Materials were independently assessed and tested and either accepted or rejected. We worked with the failed suppliers to improve their quality control procedures and have recently agreed with all suppliers a monthly testing and accreditation regime that ensures that all recycled materials utilised are fit for purpose. In addition, we have financially assisted the suppliers with these startup costs.

We have actively encouraged our recycling suppliers to produce recycled products without the use of cement-based additives or stabilisers. Although these additives help improve the strength of the backfill materials, they are not environmentally sustainable and we are therefore keen to develop 100% pure recycled materials in our operations.