Indicators and trends

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Indicator name				Version
BW6 Water Leakage and Losses				**30/05/18**
Indicator type:	**Risk/opportunity**	**Impact**	**Action**	
			X	

SCCAP Theme	SCCAP Objective	CCRA risk/opportunity
Buildings and infrastructure networks	B2: Provide the knowledge, skills and tools to manage climate change impacts on buildings and infrastructure N2: Support a healthy and diverse natural environment with the capacity to adapt	BD15 Increased societal water demand WA5 Public water supply-demand deficits

At a glance

- This indicator covers leakage and losses to water supply, and provides a measure of the effectiveness of the strategies employed by Scottish Water to reduce distribution losses
- The effects of climate change and an increase in the Scottish population base may increase the pressure on available water resources
- The volume of water lost through leakage has decreased annually since 2008
- Scottish Water is continuing its programme of leakage reduction, which should help maintain losses at the 'economic level of leakage' (ELL)

Latest Figure	Trend
2016/17: Leakage of 494.76 megalitres per day (Ml/d). This is 4.87 megalitres per day less than in the previous reporting period.	There has been a decrease in the volume of water lost through leakage each year between 2008/09 and 2016/17.

Why is this indicator important?

Although Scotland is a relatively water rich country, there are not unlimited resources available for treatment and supply. The combined effect of climate change and the growing population may

increase pressures on available water resources (Scottish Water, 2012). Possible climate impacts include changes in the quality and availability of water resources, increased variability in rainfall patterns, and restrictions on discharging wastewater to the environment (Scottish Water, 2013).

Managing and minimising the volume of water lost through leakage is important to ensure that sufficient water remains both for water users and the originating environment. Ensuring that water resources are used in a sustainable way is critical to Scotland's future prosperity (Scottish Water, 2012) and is a vital part of Scottish Water's sustainability duty (Scottish Water, 2012).

Scottish Water has a legal duty to promote water conservation and water-use efficiency as part of the Climate Change (Scotland) Act 2009 (Section 74), as covered in Section 56(1) of the Water Industry (Scotland) Act 2002. This is reiterated in Water Framework Directive and the Water Environment and Water Services (Scotland) Act 2003 (Scottish Water, 2012).

Related Indicators
BW7 Customers and zones vulnerable to supply deficit
BW8 Domestic water usage
BW9 Non-domestic water usage
NB27 Summer low flow events in Scottish rivers

What is happening now?

Scottish Water maintains over 48,000 km of water pipes, and, ahead of target, successfully reduced leakage to the Economic Level of Leakage (ELL) – the point where the cost of reducing leakage becomes greater than the savings from reduced water production (Scottish Water, 2012). Teams not only respond to reported bursts but also actively detect and fix leaks underground (Active Leakage Control). They also make increased use of innovative technology, and are investing in pressure regulation with the aim of reducing the likelihood that bursts will impact on customers (Scottish Water, 2014b). In the 2016-2017 reporting period, leakage was 494.76 megalitres[1] per day. This is 4.87 megalitres per day less than in the previous reporting period.

Scottish Water set a more ambitious leakage target of below 500 megalitres per day during the 2015-21 regulatory reporting period(Scottish Water 2016), and achieved their forecast of achieving a leakage rate of 490 – 510 megalitres per day in 2015/16 (Scottish Water 2016).

What has happened in the past?

The leakage statistics are calculated for a single year between the 1st of April and 31st of March. Table 1 shows the total leakage in Ml/d following 'Maximum Likelihood Estimate adjustment' (see methodology section for details). The 'Maximum Likelihood Estimation' (MLE) leakage assessment was introduced in 2008/09, and was made possible due to improved District Metered Area (DMA) coverage/operability and an acceptable Top-down / Bottom-up reconciliation range within the Water Balance (Scottish Water, 2009). There are pre-2008 figures available but changes in measurement and reporting make 2008 a reliable baseline.

Figure 1 and Table 1 show that leakage losses have decreased each year. In 2016/17, the volume of water lost had fallen by more than 320 megalitres (39.4 %) compared to 2008/09.

[1] A megalitre is one million litres.

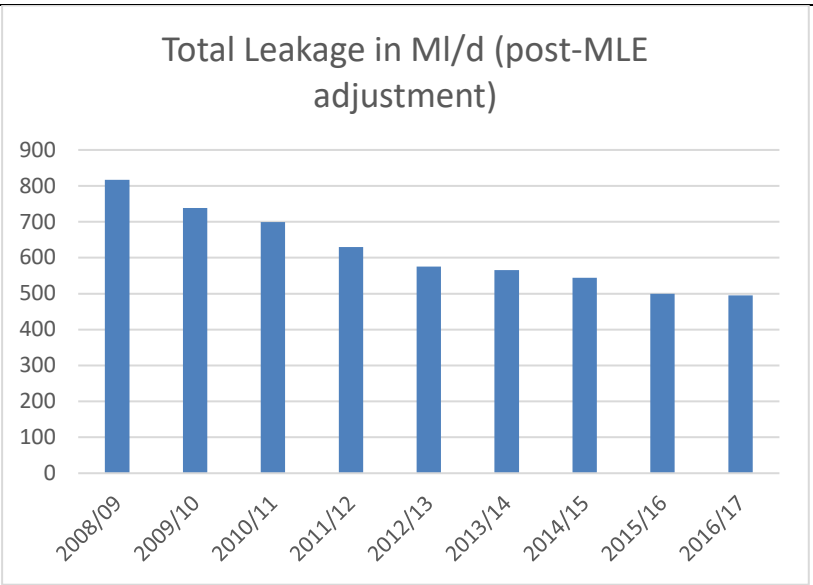

Figure 1 Total leakage in megalitres per day (Ml/d)

Year	Total Leakage in Ml/d (post-MLE adjustment)
2008 - 09	816.41
2009 - 10	738.21
2010 - 11	699.15
2011 - 12	629.24
2012 - 13	575.15
2013 - 14	565.84
2014 - 15	543.99
2015 - 16	499.63
2016 - 17	494.76

Table 1 Total leakage in megalitres per day (Ml/d)

What is projected to happen in the future?

Climate change may change the availability and quality of water sources (Scottish Water, 2013), which could impact on future water supplies. Scottish Water is committed to leakage management, and as part of their 2015-2021 Business Plan they propose to reduce the time taken to respond to visible leakage from 3 days to just one In setting price limits, the Water Industry Commission for Scotland (WICS) included a £40m capital maintenance allowance to allow sustained investment in leakage assets and some further “exceptional item” investment to facilitate progress towards the ELL.

Patterns of change

Leakage has reduced consistently since the targeted leakage reduction programme was initiated at Scottish Water in 2006 (Scottish Water, 2013). This programme should allow them to maintain, and potentially continue to improve, the economic level of leakage (ELL).

Interpretation of indicator trends

The figures show a yearly reduction in water leakage. In 2016/17, actual leakage was 495 million litres per day, significantly below the minimum service level (575 Ml/d), and below 500 Ml/d, the level achieved in the previous year and the target level for the end of the 2015-2021 regulatory control period (Water Industry Commission for Scotland 2017).

Limitations

No comparable data is available prior to 2008.

References

Scottish Water (2012). *Water Efficiency Plan 2011- 2015*. Scottish Water. Available online at: http://www.scottishwater.co.uk/assets/domestic/files/you%20and%20your%20home/water%20efficiency/swwaterefficiencyplan.pdf

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Scottish Water (2014a). *Scottish Water Annual Return Tables 2013-2014*. Scottish Water. Available online at: http://www.watercommission.co.uk/UserFiles/Documents/SECTION%20A%20TABLES%202013-14%2013Jun14.pdf

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Scottish Water (2016). *Scottish Water Delivery Plan 2015 to 2021.* Scottish Water. Available online at:

http://www.scottishwater.co.uk/assets/about%20us/files/key%20publications/swdeliveryplan201521update2016.pdf

Water Industry Commission for Scotland (2017). *Scottish Water's Performance 2016-17.* Water Industry Commission for Scotland. Available online at: https://www.watercommission.co.uk/view_Performance reports.aspx

Further information

Acknowledgements

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Katherine Beckmann (Heriot-Watt University/CXC) contributed to this indicator.

This indicator was updated in 2018 by Ruth Monfries (Royal Botanic Garden Edinburgh/CXC).

Appendix One: Indicator metadata and methodology

Table 1: Indicator metadata

	Metadata
Title of the indicator	BW6 Water Leakage and Losses
Indicator contact: Organisation or individual/s responsible for the indicator	ClimateXChange
Indicator data source	The Water Industry Commission for Scotland Website – Data supplied by Scottish Water
Data link: URL for retrieving the indicator primary indicator data.	https://www.watercommission.co.uk/view_Regulatory_data.aspx

Table 2: Indicator data

	Indicator data
Temporal coverage: Start and end dates, identifying any significant data gaps.	April 2008 – March 2017 (ongoing)
Frequency of updates: Planned or potential updates	Data is updated annually. A year runs from 1st April to 31st March.
Spatial coverage: Maximum area for which data is available	Scotland
Uncertainties: Uncertainty issues arising from e.g. data collection, aggregation of data, data gaps	
Spatial resolution: Scale/unit for which data is collected	Megalitres delivered per day (including losses)
Categorical resolution: Potential for disaggregation of data into categories	
Data accessibility: Restrictions on usage, relevant terms & conditions	Publicly Available Data

Table 3 Contributing data sources

Contributing data sources Data sets used to create the indicator data, the organisation responsible for them and any URLs which provide access to the data.
http://www.watercommission.co.uk/view_Regulatory_data.aspx

Table 4 Indicator methodology

Indicator methodology The methodology used to create the indicator data
The indicator is derived from data supplied to the Water Industry Commission for Scotland in Scottish Water's Annual Return tables https://www.watercommission.co.uk/view_Regulatory_data.aspx The unadjusted total leakage figure is formed by summing the District Metered Area (DMA) reported leakage, Service Reservoir leakage and Trunk Main leakage. The water balance closing error represents the difference between the water balance determination of total leakage ('top-down') and the estimate from component analysis of DMA leakage ('bottom up'). A Maximum Likelihood Estimation (MLE) adjustment re-assigns any difference based around the expected uncertainty of each component (Scottish Water, 2014b). This provides the post-MLE adjustment figures, which are provided in Table 1.