

Water NRW · Priimal Pulse NRW

USD 141 billion: estimated annual global financial cost of non-revenue water to water utilities (World Bank Water Supply and Sanitation Sector Board, Kingdom, Liemberger and Marin, 2006)

What is water NRW?

Non-revenue water (NRW) is water that enters the distribution system but generates no revenue. It has two components. Physical losses are water that leaks from pipes, storage, or service connections before reaching a customer. Apparent losses, also called commercial losses, are water that reaches consumption but is not billed: meter under-registration, illegal connections, billing errors, and unmetered supply. The IWA Standard Water Balance sets a benchmark of below 20% of system input volume as acceptable NRW performance; many developing-market utilities operate at two to three times this rate. Apparent losses are the commercially recoverable component and the direct focus of revenue assurance analytics.

The financial reality

NRW rates in major urban utilities across Sub-Saharan Africa, South Asia, and Latin America typically range from 30% to 50% of system input volume, with apparent losses accounting for 30 to 50% of total NRW (World Bank and IWA benchmarking data). For a mid-sized water utility with 200,000 active connections, average monthly consumption of 15 cubic metres at a blended tariff of EUR 0.80 per cubic metre, the annual billing base should be EUR 28.8 million. At a 35% total NRW rate with apparent losses at 40% of that, the annual apparent loss exposure is approximately EUR 4.0 million. At an illustrative 50% recovery rate, the recoverable annual value would be approximately EUR 2.0 million. Apparent losses persist because billing records, meter read histories, and connection registers have never been designed to be cross-referenced at the individual account level.

Dominant loss typologies

- **Illegal connections and unauthorised abstractions:** Connections made directly to the distribution main ahead of the meter, or unregistered service connections, result in water consumption with no billing record.
- **Meter under-registration:** Positive displacement and turbine meters degrade mechanically over time, progressively under-recording consumption, particularly at low flow rates.
- **Data errors and unmatched accounts:** Billing system records fail to match supply addresses to metered accounts, and account closures or property changes are not updated in time.
- **Unmetered supply to municipal or institutional users:** Hydrant use, tanker supply, and water provided to government buildings without metering or billing can account for 5% or more of system input volume.
- **Billing errors and disputed reads:** Manual meter reading introduces transcription errors; disputed reads adjusted downward without inspection create recurring loss patterns.

Regional context

A World Bank review of African urban utilities (2021) found median NRW rates of approximately 40%, with several West and East African utilities exceeding 50%. South and Southeast Asian utilities show median NRW of 25 to 35% (World Bank IBNET database). Latin American urban utilities average 35 to 40% (IWA benchmarking data). Even Western European utilities report NRW between 15% and 25%: the European Commission's Blueprint to Safeguard Europe's Water Resources cites average real losses of around 26% in EU water systems, with apparent losses accounting for a meaningful share in markets with older meter estates.

Priimal Pulse NRW: A Vantage product

Priimal Pulse NRW is an AI-scoring and case management platform for non-revenue water. Water utilities upload their existing billing records, meter read histories, and consumption data. Vantage scores every account and returns a ranked case queue for the investigation team, prioritising accounts where apparent loss indicators are strongest. Available under Core Value: pay a share of documented recovered value only, capped at the equivalent flat-rate subscription price. Nothing recovered, nothing owed. To learn more, visit priimal.com or contact connect@priimal.com.