Introduction

Case studies are vital to the success of the Leakage Emissions Initiative (LEI) because they tangibly demonstrate the profound environmental benefits of proactive leakage reduction projects. These studies showcase real-world examples of how reducing real water loss (physical leakage) simultaneously minimizes greenhouse gas emissions. By compiling and sharing these success stories on the IWA WLSG LEI website (www.leigroup.org), we create a powerful resource that advances our mission in the following ways:

- **Validates the LEI Methodology:** Case studies provide concrete evidence of the quantifiable carbon savings achievable through the LEI methodology. This validation is essential for building confidence in our approach among water utilities, governments, and funding agencies.
- **Inspires Action:** Case studies highlight the positive outcomes of leakage reduction projects, demonstrating the feasibility and impact of these initiatives. This can motivate hesitant utilities to embark on their own leakage reduction journeys.
- **Attracts Funding:** By quantifying carbon savings, case studies make a compelling case for investment in leakage reduction projects. This evidence is particularly appealing to environmentally conscious funding organizations seeking to maximize their climate impact.

Importance of Complete Information

To ensure their maximum value, case studies should adhere to data collection standards. The following information is essential:

- **Context:** A clear understanding of the utility, the region, and the project's specifics gives the carbon savings meaningful context.
- **Data Integrity:** Defensible data collection and accurate calculations are critical to the LEI methodology. This underscores the importance of using consistent measurement techniques and providing clear documentation.
- **Transparency:** Full disclosure of the methodology and data used in the case study helps establish trust and allows others to potentially replicate the results.

Case Study Template

Project Background Information

- **Utility and Service Area:** Name of the utility and a brief description of the region it serves.
- **Project Summary:** Key goals, methods, and outcomes of the leakage reduction project.

Data Collection

- **System Input Volume:** Total water produced by the utility in the year prior to the project and for each subsequent year after the leakage reduction project.

- **Leakage Reduction:** Total accumulation of leakage reduction achieved, annually calculated using a utility-calculated or IWA/AWWA-approved water balance.
- **Energy Consumption:** Annual electricity consumption across the utility's water assets, as measured by utility service providers.
- **Energy Carbon Intensity:** Carbon intensity of the regional electric grid (that supplied the utility energy) in grams of CO2 per kilowatt-hour consumed (g/kWh CO2). This data is available from sources like https://www.electricitymaps.com, https://www.irena.org/, and potentially from the electric utility itself.

LEI Methodology Calculation

The LEI calculation methodology quantifies the annual carbon savings achieved due to leakage reduction. Refer to the IWA White Paper and Leakage Emissions Calculator on the LEI website's resources page: https://www.leigroup.org/resources

	Imperial Unit Ex.		SI Units Example		Calculation Notes
Total Water Produced	16,636	MG/Yr	62,974,110	m^3/Yr	From Standard Water Balance
Total Power cost	7,600,000	$/Yr	14,560,000	USD$/Yr	From utility's energy bill
Cost of Power	0.33	$/Kwh	0.33	USD$/kWh	From utility's energy bill
CO2 Assoc w/ Source	1080	g/kWh	1,080	g/kWh	From utility's energy source(s) https://app.electricitymaps.com/map?aggregated=false
CO2 Equivilant Emission Rate**	**2,381**	lb/MWh	**1,080,000**	g/MWh	Conversion Kw ==> Mw (Multiply by 1,000)
Total Power	44,417	kWh/yr	44,416,771	kWh/yr	*Energy Cost* ($/Yr) divided by *Utility Energy Cost Rate* ($/KWh)
Energy Intensity	**3**	Wh/gal	**1**	kWh/m^3	*Utility Energy Usage* divided by *Volume of Water Supplied*
Carbon Intensity	**0.0064**	lb/gal	**762**	g/m^3	Multiply *Reference Carbon Intensity* by *Utility Energy Intensity*
Target Leakage Volume Reduction	3,327	MG/yr	**12,594,065**	m^3/Yr	Manual inputs to calculate Target Carbon Reduction
Carbon Reduction	**21,149,945**	lb/Yr	**9,593,445,834**	g/Yr	Multiply target by Carbon Intensity
Carbon Reduction	**10,575**	tn/Yr	**9,593**	mt/Yr	Conversion to Metric Tons per year (divide grams/1,000,000)

input cells	
calculated cells	