

## Appendix D: Example Utility Measures

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### 1. Product Quality: Example Measures

Produces potable water, treated effluent, and process residuals in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs.

#### Example Measures

##### Drinking Water Utility Measures

- 1) Pressure adequacy: Percent of customers with less than XX psi of pressure at the meter during normal operations.
- 2) Drinking water supply outages: Percent of retail customers experiencing water outages for one or more events totaling more than X hours/year.
- 3) Drinking water system reliability: Number of customer hours out of service per year divided by the total number of customer hours in that year.
- 4) Drinking water system reliability: Number of main breaks per mile of pipe per year.
- 5) Water quality complaints: Percent of customers that complain about water quality.
- 6) Turbidity: Monthly turbidity average (NTU) of filtered water.
- 7) Fire hydrant condition: Number of inoperable or leaking hydrants per 1,000 hydrants.
- 8) Fire hydrant flow: Percent of hydrants where flow available achieves required flow.
- 9) Drinking water compliance rate: Number of days in full compliance (times 100) divided by 365 days.<sup>1</sup>

##### Wastewater Utility Measures

- 10) Sewer overflows: Number of sewer overflows per 1,000 miles of pipe per year. Note: Utilities may wish to break this down into wet-weather and dry-weather overflows. Some overflows are allowable—the absolute number of overflows should be considered in this context.
- 11) Number of environmental violations: Number of documented regulatory violations (common utility measure). Note: This could include measures of the number of significant non-compliance violations (SNC) under the Clean Water Act and/or other violations.
- 12) Problem responsiveness: Percent of sewer system problems (backups, voids, lid off, ponding) responded to within a target period of time. Note: Problem responsiveness in this context also relates to operational optimization. It could also relate to customer service;

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<sup>1</sup> QualServe benchmark

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however, in these instances, maintaining “product quality” involves identifying and addressing problems *before* the customer is aware that problems exist.

- 13) Wastewater treatment effectiveness rate (compliance with effluent quality standards): Total number of standard non-compliance days (sum of all non-compliance days relative to all operating/discharge permits issues to the utility for an individual facility).<sup>2</sup>
- 14) Compliance monitoring measures (day-to-day operational): e.g., number of days permit parameters are maintained consistent with NPDES permit limit per year.

## 2. Customer Satisfaction: Example Measures

Provides reliable, responsive, and affordable services in line with explicit, customer-accepted service levels. Receives timely customer feedback to maintain responsiveness to customer needs and emergencies.

Considerations regarding measurement of customer satisfaction are as follows.

- Regardless of how done, it is important to measure customer satisfaction consistently (e.g., once every six months or once a year) to understand changes over time.
- People who call into utilities represent a small fraction of the total customer base; therefore, it is important to measure customer satisfaction beyond incoming calls. There are more and less intensive ways to gauge broad customer satisfaction, e.g., using the invoice process to gather information, holding focus groups, conducting statistically-significant telephone surveys, etc.

### Example Measures

#### Basic Measures

- 1) Number of customer complaints: e.g., number of customer complaint calls in daily reports. The number of customer calls (in general, not specific to customer complaint calls) is sometimes used as a customer satisfaction measure; but it alone is not necessarily associated with customer *satisfaction*. Calls may be placed for routine purposes such as turning on meters/service, or because customers lost their bills. For this reason, this example measure specifies the number of customer complaint calls. Other categories of incoming calls could also be used to track those that are related specifically to customer satisfaction.<sup>3</sup>
- 2) Customer service complaint rate: Percent of customer service complaints divided by number of active customer accounts.<sup>4</sup>
- 3) Customer service cost per account: Total customer service costs divided by number of active accounts.<sup>5</sup>

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<sup>2</sup> QualServe benchmark

<sup>3</sup> Common measure, also a QualServe benchmark

<sup>4</sup> QualServe benchmark

<sup>5</sup> QualServe benchmark

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### Responsiveness Measures

- 4) Responsiveness/rapidity of response: Percent of calls received and answered within a target timeframe.
- 5) Responsiveness: Number of customer calls dropped or abandoned.
- 6) Responsiveness/first call resolution: Number of customer calls resolved in one contact divided by total number of calls received. Note: this measure tracks the identity of the caller to ensure that the same customer is not calling back with the same problem.
- 7) Customer work order response time: Percent of customer work order requests completed within established service standards.

### Comprehensive Customer Satisfaction Measures

- 8) Overall customer satisfaction: Percent of customers rating overall job as “good” or “excellent” (through a customer service survey).

## 3. Employee and Leadership Development: Example Measures

Recruits and retains a workforce that is competent, motivated, adaptive, and safe-working. Establishes a participatory, collaborative organization dedicated to continual learning and improvement. Ensures employee institutional knowledge is retained and improved upon over time. Provides a focus on and emphasizes opportunities for professional and leadership development and strives to create an integrated and well-coordinated senior leadership team.

Note: Safety measures are under the “Operational Resiliency” Attribute.

### Example Measures

#### Human Resources Management

- 1) Turnover: Annual percentage of total and voluntary turnover.
- 2) Overtime: Total number of O&M overtime hours worked divided by total number of O&M hours.
- 3) Workforce succession planning: Does the utility have a current long-term workforce succession plan that accounts for projected retirements and other vacancies in each skill and management area (Yes/No)?
- 4) Professional development: Percent of employees that have employee development plans.
- 5) Professional development: Percent of employees eligible for certification that have attained it.
- 6) Professional development: Does the utility have a leadership development program that includes leadership training and other leadership-building opportunities (Yes/No)?

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- 7) Employee satisfaction survey: Does the utility conduct an employee satisfaction survey (Yes/No)? **OR** Union grievances: Number of union grievances filed.

Productivity

- 8) Labor productivity: Staff per 1,000 water/sewer/water and sewer population served.

### 4. Operational Optimization: Example Measures

Ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations. Minimizes resource use, loss, and impacts from day-to-day operations. Maintains awareness of information and operational technology developments to anticipate and support timely adoption of improvements.

#### Example Measures

- 1) Cost per million gallons produced / treated: O&M expenses (e.g., chemical, power, and/or total cost) per million gallons produced and delivered.
- 2) Distribution system water loss: Percent of produced water that fails to reach customers and cannot otherwise be accounted for through authorized usage.<sup>6</sup> This is equivalent to: Non revenue water: Difference between water supplied and water sold (i.e. volume of water “lost”) expressed as a percentage of net water supplied.<sup>7</sup>
- 3) Sewer system effectiveness: Percent of customers experiencing backups in any year caused by the utility’s sewer system.
- 4) Finished water efficiency rate (for surface water plants): Finished water as a percent of raw water.
- 5) Efficiency ratio: O&M expenditures relative to revenue.
- 6) Planned maintenance ratio: Planned maintenance ratio in percent (hours): hours of planned maintenance (times 100) divided by hours of planned and corrective maintenance.<sup>8</sup>
- 7) Direct energy use: Total amount of energy used (including renewable energy) per 1,000 customers.<sup>9</sup>
- 8) Material waste: Percentage of materials used that are wastes (processed or unprocessed) from sources external to the utility.<sup>10</sup>

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<sup>6</sup> QualServe benchmark

<sup>7</sup> The International Benchmarking Network for Water and Sanitation Utilities (IBNET) indicator definition

<sup>8</sup> QualServe benchmark

<sup>9</sup> Adapted from GRI 2002, Water U.K. 2005, and Australian VicWater 2003 measures as reprinted in Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 112 (draft)

<sup>10</sup> Adapted from GRI 2002

## 5. Financial Viability: Example Measures

Understands the full life-cycle cost of the utility and establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Establishes predictable rates—consistent with community expectations and acceptability—adequate to recover costs, provide for reserves, maintain support from bond rating agencies, and plan and invest for future needs.

### Example Measures

#### Basic Measures

- 1) Rates: Average monthly bill relative to similar utilities (common measure). Note: Some utilities may wish to compare against a national average; others may choose to measure against utilities in nearby areas. In addition, it is important to note that rates are a function of many factors and simple comparisons of different utilities' rates may be misleading.
- 2) Water use per customer: Meter sales per customer account.
- 3) Revenues to expenditures: Ratio of revenue to expenditure.
- 4) Return on assets: Net income divided by total assets.<sup>11</sup>
- 5) Return on equity: Annual return as a percentage of shareholder equity.

#### Liabilities and Debt

- 6) Debt ratio 1: Total liabilities divided by total assets.<sup>12</sup>
- 7) Debt ratio 2: Percent of debt greater than 180 days/total revenue.

#### Projections Versus Actual

- 8) Operating revenue versus plan: Operating revenue for the period/planned revenue for the period
- 9) Operating expenditures versus planned expenditures: Percent of O&M expenditures for current year versus planned O&M in the 10-year finance plan.

#### Cost Recovery

- 10) Full cost recovery: Economic water and wastewater real rates of return.
- 11) Rate adequacy: Rate revenue relative to long term infrastructure replacement cost.

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<sup>11</sup> QualServe benchmark

<sup>12</sup> QualServe benchmark

### 6. Infrastructure Stability: Example Measures

Understands the condition of and costs associated with critical infrastructure assets. Maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable risk consistent with customer, community, and regulator-supported service levels, and consistent with anticipated growth and system reliability goals. Assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.

#### Example Measures

##### Asset Condition

- 1) Asset condition: Percent of assets for which a condition assessment has been conducted.
- 2) Sewer cleaning: Percent of sewers cleaned each year.
- 3) Sewer inspections: Linear feet of sewer lines televised each year divided by total linear feet of sewer lines.
- 4) Manholes inspected: Percent of manholes inspected per year.
- 5) Water distribution system integrity: Total annual number of leaks and pipeline breaks per 100 miles of distribution piping.<sup>13</sup>
- 6) Collection system integrity: Number of collection system failures per 100 miles of collection system piping per year.<sup>14</sup>
- 7) Planned maintenance ratio: Percent per hours and percent per cost.<sup>15</sup>

##### Asset Management Planning and Implementation

- 8) Comprehensive planning: Does the utility have a long-term comprehensive plan that addresses future asset needs (Yes/No)?
- 9) Asset renewal/replacement rate: Total actual expenditures (or total amount of funds reserved for renewal and replacement for each asset group) divided by the total present worth for renewal and replacement for each asset group.<sup>16</sup> Note: this is a system of measures that requires breaking down assets into classes (e.g., water treatment facilities, water distribution system, wastewater collection assets, wastewater treatment facilities, wastewater miscellaneous assets) and having data with which to support the calculations (e.g., total present worth of renewal and replacement needs for each asset class).
- 10) Capital reinvestment: Five-year running average of capital reinvestment relative to replacement value.

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<sup>13</sup> QualServe benchmark

<sup>14</sup> QualServe benchmark

<sup>15</sup> QualServe benchmark

<sup>16</sup> QualServe benchmark

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- 11) Capital investment progress: Percent of capital investment projects started and completed on time and on budget (according to a capital improvement plan).

### 7. Operational Resiliency: Example Measures

Ensures utility leadership and staff work together to anticipate and avoid problems. Proactively identifies, assesses, establishes tolerance levels for, and effectively manages a full range of business risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related) in a proactive way consistent with industry trends and system reliability goals.

#### Example Measures

##### Risk Management

- 1) Risk identification: Has the utility identified organizational risks (Yes/No)?<sup>17</sup>
- 2) Risk management planning: Does the utility have a risk management plan in place, and is this plan fully integrated into the utility (e.g., is there a high level of awareness of the risk management policies and procedures amongst the staff?) (Yes/No)?<sup>18</sup>

##### Safety

- 3) Injury frequency rate: Total accident incident rate per year.
- 4) Vehicle accident rate: Number of vehicle accidents per one million miles.
- 5) Lost time: Lost time due to accidents per 1,000 field labor hours.
- 6) Safety training: Average hours of safety-related training per employee per year.<sup>19</sup>
- 7) Compliance with health regulations and standards: Number and type of non-compliance incidences with public health regulations and standards.<sup>20</sup>
- 8) Community notification: Does your utility provide timely notification to the public about spills, sewage discharges, and other water quality problems that make it unsafe for the public to swim, recreate or consume fish from local waters (Yes/No)?<sup>21</sup>

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<sup>17</sup> Adapted from Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 109 (draft)

<sup>18</sup> Adapted from Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 109 (draft)

<sup>19</sup> NAWC Water Utility Benchmark Survey

<sup>20</sup> GRI 2002, Water U.K. 2005, VicWater 2003, and related QualServe benchmark, as repeated in Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 113 (draft)

<sup>21</sup> Philadelphia Water Department, 2005, *The Smart Watershed Program Benchmarking Tool*

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### All-Hazards Preparedness

- 9) High security risk assets: Percent of assets determined to be a high security risk by vulnerability assessment.
- 10) All-hazards preparedness: State of revisions to protocols/procedures for incorporating continuity of operations into internal utility design and construction standards for new facilities/infrastructure and major maintenance projects.
- 11) Does the utility have a current All-Hazards Disaster Readiness Response plan?
- 12) Has the utility conducted a Hazard Identification and Vulnerability Analysis?
- 13) Is the utility trained according to NIMS and ICS requirements?
- 14) Have key customers and partners in emergency management been identified and are plans coordinated and reviewed?
- 15) Has the utility typed its equipment for Mutual Aid/requesting purposes?

## 8. Community Sustainability: Example Measures

Is explicitly cognizant of and attentive to the impacts its decisions have on current and long-term future community and watershed health and welfare. Manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently use water and energy resources; promote economic vitality; and engender overall community improvement. Explicitly considers a variety of pollution prevention, watershed, and source water protection approaches as part of an overall strategy to maintain and enhance ecological and community sustainability.

### Example Measures

- 1) Community perception of utility: Does the utility seek out the views of customers, stakeholders, shareholders, and the community about its strengths, abilities, objectives, and/or strategies (Yes/No)?<sup>22</sup>
- 2) Community perception of utility: (Based on customer survey or other public information gathering effort.) Percentage of the community that believes that the utility's priorities reflect the community's priorities.
- 3) Watershed-based long-term infrastructure planning: Does the utility integrate alternative, watershed-based approaches to potentially reduce future infrastructure costs (e.g., centralized management of decentralized systems, smart growth strategies, source water protection programs, low-impact development, etc.) (Yes/No)?
- 4) Water affordability: Percent of households for whom water and sewerage service bills represent more than an affordable level of the average household income.

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<sup>22</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)

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- 5) Organizational best practices index: Summary measure on implementation of management programs important to water and wastewater utilities, including strategic planning, long-term financial planning, risk management planning, performance measurement system, optimized asset management program, customer involvement program, and continuous improvement.<sup>23</sup>
- 6) Triple bottom line commitment: Does the utility include social, economic, and environmental goal areas as part of its strategic plan (Yes/No)?<sup>24</sup>
- 7) Triple bottom line progress assessment: Does the utility employ performance measures that cover economic, social, and environmental outcomes (Yes/No)?<sup>25</sup>
- 8) Total water use: Combination of following items: amount of water extracted by source per customer; water supplied by customer type per customer; wastewater collected per customer; recycled water per customer.<sup>26</sup>
- 9) Water conservation and efficiency: Does the utility have a water conservation program (e.g., covering leakage detection, demand management, urban design, appliance efficiency, etc.) in place (Yes/No)?<sup>27</sup>
- 10) Watershed management planning: Does the utility have watershed management programs in place (and do these include measurable objectives and targets) (Yes/No)?<sup>28</sup>
- 11) Investment in watershed management: Does the utility have a long-term capital budget that extends beyond the current budget year to provide dedicated funding for watershed management (e.g., protection and restoration) projects (Yes/No)?<sup>29</sup>
- 12) Green building/infrastructure: Has the utility promoted “green building” and related water conservation strategies, both for its own assets/buildings and in terms of promoting these throughout the larger community (e.g., working with local planning departments and developers on options for new construction) (Yes/No)?

### 9. Water Resource Adequacy: Example Measures

Ensures water availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation, and public education. Explicitly considers its role in water availability and manages operations to provide for long-term aquifer and surface water sustainability and replenishment.

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<sup>23</sup> QualServe benchmark

<sup>24</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)

<sup>25</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)

<sup>26</sup> GRI 2002, Water U.K. 2005, and Australian VicWater 2003, and adapted from Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 116 (draft)

<sup>27</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 107 (draft)

<sup>28</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 109 (draft)

<sup>29</sup> Adapted from Philadelphia Water Department, 2005, *The Smart Watershed Program Benchmarking Tool*

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### Example Measures

#### Short-term Supply Adequacy

- 1) Anticipated supply versus anticipated demand: Is anticipated supply sufficient for anticipated demand (Yes/No)?
- 2) Accuracy of demand projections: Actual water demand as a percent of projected water demand.
- 3) Reduced use from recycling: Amount of potable water demand reduced through recycling.
- 4) Water losses: Percent of unaccounted water of net water (production).
- 5) Drought management: Has the utility adopted a drought management plan (Yes/No)?
- 6) Per capita water consumption: Per capita water consumption per year.

#### Long-term Supply Adequacy

- 7) Long-term supply plan: Does the utility have a long-term water supply plan that accounts for anticipated (and unanticipated) population/demand changes (Yes/No)?
- 8) Long-term demand: Does the utility know the current and projected future population and water demand for current and future service areas (Yes/No)?
- 9) Long-term supply availability: Does the utility know the number of years for which existing supply sources are adequate (Yes/No)?
- 10) Long-term demand-management plan: Does the utility have a demand management/demand reduction plan (Yes/No)?
- 11) Long-term supply management: Does the utility predict and manage for long-term water supply? For example, does it predict supply adequacy based on predictions (e.g., using average past reservoir elevation data, year-to-date reservoir elevation data, and future normal, wet, dry, and very dry scenarios) (Yes/No)?
- 12) Supply policy/commitment: Does the utility have policies in place that require that, prior to committing to new service areas, it must have adequate dry year supply, or require additional supply be provided (Yes/No)? Alternatively, does the utility have a strong commitment to denying service commitments unless a reliable drought year supply, with reasonable drought use restrictions, is available to meet the commitment (Yes/No)?

## 10. Stakeholder Understanding and Support: Example Measures

Engenders understanding and support from oversight bodies, community and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them.

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### Example Measures

- 1) Stakeholder opinion: Based on feedback from likely stakeholder groups; e.g., governance board/council, residential customers, commercial/industrial clients, developers, city/county, regional partners, legislature, regulators, public/community/special interest.
- 2) Stakeholder opinion: Does the utility have a citizen advisory panel or other method to provide stakeholder input into the utility's decision making, priority setting, etc. (Yes/No)?
- 3) Government relations survey: Does the utility conduct a written survey to mayor and other key legislative officials (Yes/No)?
- 4) Community outreach and education: Number of public education presentations per year.
- 5) Community contribution: Number of volunteer hours in the community per employee (or per 100 employees, or per XX non-volunteer hours?) per year.
- 6) Stakeholder outreach and education: Does the utility consult regularly with stakeholders (Yes/No)?
- 7) Community contribution: Does the utility approach its business in a manner that provides tangible benefits to the community (e.g., by conducting neighborhood improvements) (Yes/No)?
- 8) Transparency to stakeholders: Is the information on the utility's strategies and performance complete (cover all aspects of the utility), adequately disclosed, transparent, and readily available to customers, stakeholders, and (where applicable) shareholders (Yes/No)?<sup>30</sup>
- 9) Community outreach and education: Does the utility have a program to educate the community about the value of water, water services, and water conservation (Yes/No)?<sup>31</sup>

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<sup>30</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 106 (draft)

<sup>31</sup> From Kenway and Maheepala, *Triple Bottom Line Reporting of Sustainable Water Utility Performance*, p. 107 (draft)