Reducing Non-Technical Electricity Loss through Employee Incentive Schemes

Sector Reform & Utility Commercialization (SRUC) Project

Final Report

November 2017

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<thead>
<tr>
<th>Acronym</th>
<th>Full form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABR</td>
<td>Average billing rate</td>
</tr>
<tr>
<td>ANEEL</td>
<td>Agência Nacional de Energia Elétrica (Brazil)</td>
</tr>
<tr>
<td>AT&amp;C</td>
<td>Aggregate technical and commercial</td>
</tr>
<tr>
<td>ATCE</td>
<td>Aggregate technical and commercial efficiency</td>
</tr>
<tr>
<td>CEMIG</td>
<td>Companhia Energetica De Minas Gerais (Brazil)</td>
</tr>
<tr>
<td>CESC</td>
<td>Calcutta Electric Supply Corporation</td>
</tr>
<tr>
<td>CREG</td>
<td>Comisión de Regulación de Energía y Gas (Colombia)</td>
</tr>
<tr>
<td>DISCOM</td>
<td>Distribution company</td>
</tr>
<tr>
<td>DTR</td>
<td>Distribution Transformer</td>
</tr>
<tr>
<td>EKEDP</td>
<td>Eko Electricity Distribution Plc.</td>
</tr>
<tr>
<td>EPM</td>
<td>Empresas Publicas De Medellin (Colombia)</td>
</tr>
<tr>
<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>ESKOM</td>
<td>South African national public electric utility company (South Africa)</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>HR</td>
<td>Human Resources</td>
</tr>
<tr>
<td>IBEDC</td>
<td>Ibadan Electricity Distribution Company Plc (Nigeria)</td>
</tr>
<tr>
<td>IDECO</td>
<td>Irbid District Electricity Company (Jordan)</td>
</tr>
<tr>
<td>IEX</td>
<td>Investors exchange</td>
</tr>
<tr>
<td>KPIs</td>
<td>Key performance indicators</td>
</tr>
<tr>
<td>MIS</td>
<td>Management information system</td>
</tr>
<tr>
<td>MP Discoms</td>
<td>Distribution companies located in Madhya Pradesh (India)</td>
</tr>
<tr>
<td>MSEDCL</td>
<td>Maharashtra State Electricity Distribution Company Limited (India)</td>
</tr>
<tr>
<td>MSPDCL</td>
<td>Manipur State Power Distribution Company Limited (India)</td>
</tr>
<tr>
<td>NERSA</td>
<td>National Energy Regulator of South Africa</td>
</tr>
<tr>
<td>PI’s</td>
<td>Performance indicators</td>
</tr>
<tr>
<td>PMS</td>
<td>Performance management system</td>
</tr>
<tr>
<td>REUI</td>
<td>Relative energy usage index</td>
</tr>
<tr>
<td>RPU</td>
<td>Revenue per unit</td>
</tr>
<tr>
<td>RUEI</td>
<td>Realization per unit of energy input</td>
</tr>
<tr>
<td>SME</td>
<td>Subject matter expert</td>
</tr>
<tr>
<td>SRUC</td>
<td>Sector Reform and Utility Commercialization Program</td>
</tr>
<tr>
<td>T&amp;D</td>
<td>Transmission and distribution</td>
</tr>
<tr>
<td>TPDDDL</td>
<td>Tata Power Delhi Distribution Limited (India)</td>
</tr>
<tr>
<td>UHBVN</td>
<td>Uttar Haryana Bijli Vitran Nigam (India)</td>
</tr>
<tr>
<td>USAID</td>
<td>U.S. Agency for International Development</td>
</tr>
<tr>
<td>YOY</td>
<td>Year over Year</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENT OF PARTICIPANTS

The research team would like to thank the individuals and organizations that generously shared their time, experience, and materials for the purposes of this project. The work presented in this paper is a collaborative interpretation of the collective wisdom of the utilities and subject matter experts (SMEs) below, and it would not have been possible without their support and participation.

- AES Eletropaulo (Brazil)
- Calcutta Electric Supply Corporation (CESC) (India)
- CODENSA SA ESP (Colombia)
- Compañía Energética de Minas Gerais (CEMIG) (Brazil)
- ESKOM (South Africa)
- Eko Electricity Distribution Plc. (Nigeria)
- Empresas Públicas de Medellín (EPM) (Colombia)
- Ibadan Electricity Distribution Company Plc (IBEDC) (Nigeria)
- Irbid District Electricity Company (IDECO) (Jordan)
- Madhya Pradesh DISCOMs (India)
- Maharashtra State Electricity Distribution Company Limited (MSEDCL) (India)
- Tata Power Delhi Distribution Limited (TPDDL) (India)
- Uttar Haryana Bijli Vitran Nigam (UHVBN) (India)
- Umeme Limited (Uganda)
I. EXECUTIVE SUMMARY

Energy shortages are a common occurrence in the developing world, where the lack of reliable electricity service can impede commerce and hinder productive economic development. Despite a clear demand for more and better power services, it is not uncommon to see electric utilities in the developing world that are poorly managed and under financial stress. In these utility companies, high levels of unchecked non-technical losses are oftentimes a key contributing factor to utility insolvency. Non-technical losses, including theft, pose significant operational challenges for these utility companies and remain a multi-faceted challenge that is difficult to overcome given their resource and personnel limitations.

Utilities often fail to take advantage of (or completely lack) the operational data needed for strategic decision-making. Technology solutions and community engagement are often the interventions of choice to address non-technical losses, but such solutions can frequently be ineffective without appropriate employee programs to align reliable data gathering and employee decision-making with the needs of operational reform. Human resources (HR) incentive schemes can be a powerful tool by which management can align employee incentives with specific utility goals, such as reducing non-technical losses, to thereby accelerate change and improve performance.

The United States Agency for International Development’s (USAID) Sector Reform and Utility Commercialization (SRUC) project’s research has identified HR incentive schemes as an understudied area of utility operations, and a potential mechanism for encouraging sustainable and long-term reductions in non-technical losses. The purpose of this report is to expand the body of knowledge on this topic by investigating the establishment and execution of HR incentive schemes within developing country utilities that have successfully implemented loss-reduction programs.

The USAID/SRUC team (the “Team”) created this study to provide development practitioners with an understanding of leading utility incentive practices and how these can be used to make resource-constrained power companies more commercially viable. The report may also be useful for global power utility leadership, utility professionals, donor organizations, and other individuals implementing utility loss-reduction programs.

To understand the topic in detail, the Team reached out to more than 20 electric utilities across the developing world, and gathered detailed information on 14 relevant incentive schemes located in South Asia, Latin America, the Middle East, and Sub-Saharan Africa. From this data the Team was able to review a wide spectrum of incentive schemes to identify the structures and design considerations that made such incentive schemes successful. The Team found that utilities that have successfully implemented loss-reduction programs built their incentive schemes on a strong foundation of clear organizational goals, well-developed processes, and data leveraged from strategic system/technology implementations.

The Team discovered utility companies commonly use three different types of HR incentive structures: recognition-based, activity-based, and variable pay-based. The table below summarizes these incentive models, highlighting key characteristics, potential impacts, and the surveyed utility companies responsible for piloting these approaches. The Team then further leveraged the data collected to create an Incentive scheme Maturity Curve, which highlights the multiple stages involved with developing appropriate HR-
driven loss reduction incentives. Finally, the Team developed a roadmap to help companies establish the preconditions for HR incentive programs and ideas on their specific structures.

Figure 1: HR Incentive Scheme Models—Description and Application

<table>
<thead>
<tr>
<th>Category</th>
<th>Key Characteristics</th>
<th>Impact on Loss Reduction</th>
<th>Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition-Based Incentive Schemes</td>
<td>Basic programs based on the satisfaction gained through nonmonetary outcomes, i.e. company recognition and/or social gratification; normally the first step toward institutionalizing an incentive scheme.</td>
<td>• Direct impact on loss reduction may be minimal, but these schemes help to create a performance-oriented environment within the utility.</td>
<td>• Some form of nonmonetary incentives have been implemented across all utilities in the study.</td>
</tr>
<tr>
<td></td>
<td>• Easier to implement and focus on the recognition of good performance and associated social gratification.</td>
<td>• Utilities facing a cash crunch or financial difficulties may adopt these programs as the first step toward rewarding performance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Individual and group reward schemes can be implemented.</td>
<td>• Such incentive schemes have had mixed results and are effective when the incentive payout to the employees involved is sufficient.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Monthly, quarterly, and annual performance may be recognized.</td>
<td>• Poor design can lead to unrealistic target-setting and misreporting of data impacting the success of such schemes. Proper performance review and verification of the actual loss level is important.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Employees are recognized for their contributions to overall business goals and are rewarded with recognition or other things that might aid in their development at the utility.</td>
<td>• If implemented well, such schemes can bring losses to a manageable level, which can then be sustained using a well-defined performance-linked rewards scheme.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Some utilities have used these types of incentive schemes to incentivize contractors to assist in loss reduction efforts.</td>
<td></td>
</tr>
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<td>• Such incentive schemes have had mixed results and are effective when the incentive payout to the employees involved is sufficient.</td>
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<tr>
<td></td>
<td></td>
<td>• Some utilities have used these types of incentive schemes to incentivize contractors to assist in loss reduction efforts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• This category of incentive scheme rewards both the processes of loss reduction and the outcome of their efforts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It rewards holistic</td>
<td>AES Eletropaulo and several Indian utility companies, including CESC, two MP</td>
</tr>
<tr>
<td>Activity-Based Loss-Reduction Incentive Schemes</td>
<td>More developed programs that offer monetary rewards to employees or teams for the accomplishment of specific, measurable loss-reduction activities based on pre-determined criteria; these programs are normally stand-alone activities or dedicated company efforts.</td>
<td>• Utilities facing high losses use these programs as a measure to directly stimulate loss reduction.</td>
<td></td>
</tr>
</tbody>
</table>
### Category | Key Characteristics | Impact on Loss Reduction | Utilities
--- | --- | --- | ---
Incentive Schemes | programs are normally part of a comprehensive approach.  
- Requires a mature organizational performance management system (PMS) to be implemented (well-defined roles, processes, and a strong HR function).  
- Balanced approach to performance—a diversified portfolio of key performance indicators (KPIs) measure performance, of which loss reduction is one, but other aspects such as O&M performance, process improvement, and people-based milestones also have defined weights.  
- Departments need to define and cascade KPIs, as well as work unit performance metrics, to an individual’s performance scorecard.  
- Requires adequately well-defined and planned business processes, and the adoption of technology to manage the process.  
- Paid to an employee after undergoing an objective annual performance assessment.  
- Payout percentage is defined at the start of the year based on business targets. | performance, which goes beyond loss reduction.  
- While the incentive scheme may not always directly reward loss reduction, successful implementation helps sustain loss reduction over a period of time by bringing attention to loss-reduction metrics, which affect an employee’s overall evaluation. | DISCOMs, MSEDCL, and TPDDL have adopted performance-linked pay programs.  

The Incentive Scheme Maturity Curve provides guidance on the type of incentive scheme most likely to succeed, given the ability of an individual utility’s HR function to collect and act on data. Logically, as a utility continues to develop its HR function and loss-reduction capabilities, so the data available to decision-makers will increase, and more targeted, sophisticated, and systematic incentive schemes can be implemented, as illustrated in Figure 2, below.

*Figure 2: Loss-Reduction—Incentive Scheme Maturity Curve*
The Team found that utilities with a mature HR function have clearly established and defined process ownership and reporting structures. Accordingly, mature utilities use business review frameworks that allow them to constantly and objectively assess employee performance. Mature utilities also tended to have well-defined performance incentive schemes. When incentive schemes are aligned to overall utility goals, they can create a virtuous cycle of transparent and objective performance review - thereby encouraging employees to perform in a manner that supports reform generally, and non-technical loss reduction in particular. Meanwhile, utilities that were just beginning to develop their HR function were found to have limited feedback loops and less formalized mechanisms to assimilate and act on operational data.

The Team’s analysis shows that, in combination with clear and measurable organizational goals, HR incentive schemes can be powerful tools to promote the effective alignment of processes, organizational structures, and employee incentives with overall utility business goals. Successful utilities continuously track progress against goals and, over time, are able to create a culture of performance through evaluations based on objective and transparent data. Indeed, Team interviews with utility leadership and technical managers revealed that the planning and implementation of effective HR-driven loss-reduction incentive schemes does not result in lower non-technical losses, alone; they also promote improved employee/management connectivity, and are an indicator of an increased employee ability and willingness to adapt to other changes in their service areas.
2. INTRODUCTION

This report, funded under the United States Agency for International Development’s (USAID) Sector Reform and Utility Commercialization (SRUC) project examines the role of HR incentive schemes in utility companies in developing countries as a potential tool to encourage company staff to mitigate non-technical losses. The report gathers insights from a wide range of utilities—public and private, urban and rural, on different continents, and with different regulatory contexts—that are all working to address non-technical loss issues in some form.

After first introducing the reader to the topic of electricity sector losses, and describing the study’s methodology and scope, the report presents the USAID/SRUC team’s (the “Team”) main findings from surveys and interviews conducted with representatives from the focus utilities’ management. The report outlines different types of utility incentive schemes identified, explaining their unique characteristics, and describes the Team’s HR maturity model to help practitioners understand possible means to implement incentive schemes in areas where they operate. The Team then presents a high-level approach to establish the baseline preconditions for an HR incentive scheme within a utility’s broader loss-reduction effort. The report’s last sections offer recommendations for development practitioners and potential next steps for further research in this field.

During the initial research, the Team noted that many studies approach the issue of non-technical loss reduction only from the lens of the customer, attempting to understand how and why utility customers connect to the grid illegally. Customer-facing technological solutions (such as prepaid meters and smart meters) to improve tariff collection rates are well-researched, as are successful approaches for community engagement. However, few studies take the utility manager’s perspective in seeking to align the motivations of his or her personnel to the goals of the utility. This study attempts to fill that gap by exploring the incentive schemes utilities employ to reward staff and successfully mitigate non-technical losses across a broad range of geographies, demographics, and sector structures. While HR incentives for loss reduction are an under-documented area in general, some higher-level background studies in the use of performance incentives are included in the footnotes below.


2.1 BACKGROUND—THE IMPORTANCE OF LOSS REDUCTION IN THE POWER SECTOR

The basic mandate of a power utility company is to provide safe, reliable, and affordable electricity to its residential, commercial, and industrial customers. A financially sustainable and efficiently operated utility acts as the lynchpin of a sound electricity sector, and can provide high-quality power to its customers while maintaining a portfolio of baseload and variable (renewable) generation. In many developing countries, however, high levels of transmission and distribution losses (T&D losses) impede the utility company’s ability to operate, maintain, and invest in its transmission and distribution network.

To understand how electricity losses differ across geographies, it is helpful to have an idea of loss levels across the globe and at different levels of development. Standard levels of aggregated T&D losses for a benchmark utility are generally around 6 percent to 8 percent for the developed world (Europe and North America), but range much higher in some emerging economies.

Figure 3: Example Transmission and Distribution Losses by Country (% of Output)²

As Figures 3 and 4 illustrate, T&D losses levels vary widely around the world. Losses in South American countries range from 6 percent to 17 percent, while India has an average T&D loss level of 18 percent, with strong variances between some state utility companies and others. Finally, there are some countries, such as Haiti—one of the world’s worst examples of energy theft and utility mismanagement—where T&D losses total more than 54 percent.

T&D losses are composed of technical losses, which are endemic to the physics of electrical networks and an engineering challenge for all utility systems, and non-technical losses, which are the result of business governance challenges and much more common in developing countries. This report focuses on non-technical types of losses and the staff incentive schemes that utilities can put in place to control them.

A variety of factors affect a company’s level of non-technical T&D losses, but most stem from a utility’s management and governance. Some of the major factors contributing to high levels of non-technical losses include the following:

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4 Exact percentages are as follows: Brazil (16.4%), Argentina (16.0%), Ecuador (12.95%), Colombia (11.76%), Paraguay (5.78%), Chile (6.69%), Bolivia (9.02%), and Peru (10.51%).
5 Jammu & Kashmir (62%) has the highest and Himachal Pradesh (11.08%) has the lowest AT&C loss among all Indian states.
6 Technical losses occur naturally and consist mainly of power dissipation in electricity system components, such as transmission and distribution lines, transformers, and measurement systems. Technical losses are a natural side effect of the physical delivery of electric energy. Technical losses levels are primarily an engineering issue dependent on electrical system design and infrastructure.
7 Actions external to the power system cause non-technical losses, and consist primarily of electricity theft, nonpayment by customers, as well as errors in accounting, administration, and record-keeping.
- Weak utility management, oversight, and poor governance structures in the company
- Political interference in the management of the company’s core functions
- Inability to focus and invest in proven anti-theft solutions
- Inaccurate baseline data and lack of accurate energy auditing to identify areas of losses
- Limited enforcement and action taken to reduce losses in high theft areas
- Inability to accurately bill and collect for delivered power
- Limited ability to collect and analyze data from field offices
- Cultural acceptance of nonpayment
- Poor design or lack of proper infrastructure leading to high technical system losses
- Poor metering technology and penetration

High levels of non-technical losses reflect an inability on the part of the utility to collect adequate remuneration for the power delivered. This lack of cash flow then impedes the utility’s ability to serve its customers, since the low level of revenue prevents it from investing in capacity expansion, needed upgrades, and routine and preventative maintenance. The lack of investment further exacerbates technical loss levels, reducing system reliability and causing those consumers who do pay regularly to question why they should continue to do so when faced with sub-par performance. This technical and financial progression can quickly become a vicious cycle for utility management, as their margins diminish and demands for improved service quality increase from their customer base.

A 2016 World Bank report on the financial viability of Africa’s electric utilities illustrated that, of the components under a utility company’s control, T&D losses in excess of 10 percent accounted for the largest portion of a utility company’s quasi-fiscal deficit and its inability to recover costs at benchmark (or efficient) levels of performance. The study further showed, perhaps not surprisingly, that utilities with high T&D losses also had high bill collection losses, suggesting that poor management can lead to high losses across the entire supply chain.

The impact of T&D losses is significant, both for utility companies and for the economies of Sub-Saharan Africa as a whole. The scale of these quasi-fiscal utility deficits—the difference between the benchmark and actual revenues received by Africa’s power companies—averages 1.5 percent of the continent’s gross domestic product (GDP).

### 2.2 RESEARCH METHODOLOGY

The Team identified an initial set of more than 40 utilities for this study. This initial group of utilities was selected based on their documented attempts to spearhead T&D loss-reduction performance efforts. The Team then used a data-driven approach to identify those utilities that were most effective at reducing losses, as well as those most able to provide qualitative and quantitative data on their loss-reduction programs. After further study, the Team contacted 20 utilities to request their input for a survey examining incentive structures, institutional capacity, and loss levels. Ultimately, the Team received 14 survey responses and interviewed in depth representatives of seven utilities.

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Utilities surveyed for this study, the sample includes four utilities from South and Central America, four from Africa, five from Asia, and one from the Middle East.

The following table presents the key factors used by the Team to finalize the set of 20 utility companies selected for the survey. These factors considered the efficiency of individual utility companies, the health/performance of the relevant national electricity sector as a whole, and any previous history working with USAID.

**Figure 5: Participant Selection Factors Considered**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factors Used in the Selection Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Electricity Loss Reduction (%)</td>
<td>To identify utility companies that focused on loss reduction and used some loss-reduction initiatives. The average reduction of non-technical losses in 2015 at the top 10 utilities surveyed was 6.75 percent.</td>
</tr>
<tr>
<td>Access to Electricity (%)</td>
<td>To identify utilities that are of notable size and provide electricity to a wide range of customers. This report defines access to electricity as the number of households with access to the minimum level of electricity that a power utility company supplies.</td>
</tr>
<tr>
<td>Stand-alone Loss-Reduction Group</td>
<td>To note the existence of an internal stand-alone loss-reduction group within the utility with dedicated mandate for driving loss reduction efforts and the ability to support an incentive scheme. Nearly all utilities the Team surveyed had a group responsible for loss-reduction efforts.</td>
</tr>
<tr>
<td>Loss-Reduction Targets</td>
<td>Existence of loss-reduction targets indicated utilities that are working toward defined goals. In most cases, the regulator set these targets as part of the periodic tariff setting process.</td>
</tr>
<tr>
<td>Employee/Community Engagement Programs</td>
<td>To identify utilities that have defined community engagement initiatives to connect with their customers on issues related to non-technical losses. This helps illustrate the level at which the utility company has invested in community relations efforts.</td>
</tr>
<tr>
<td>Country Regulatory Environment</td>
<td>Existence of regulatory conditions that might be more or less be conducive to incentive scheme success. In general, regulatory regimes that employed performance-based regulation and set loss-reduction targets were linked to a utility company that had dedicated loss-reduction incentive schemes.</td>
</tr>
<tr>
<td>Existence of Antitheft Laws and Adequate Judicial Systems</td>
<td>A judicial system empowered to prosecute cases related to electricity theft is critical for successful loss reduction. All of the countries in which the Team examined had some kind of antitheft law, although the application of these laws varied.</td>
</tr>
<tr>
<td>USAID Awareness</td>
<td>The Team gave special consideration to utilities that had worked with USAID on similar projects in the past, in order to facilitate the survey and interview process.</td>
</tr>
</tbody>
</table>

Once the Team selected the final set of utilities, it sent a survey to a representative from that company. In a majority of cases, company employees responsible for loss reduction efforts compiled answers to the survey. Generally, the loss-reduction team fell under the overall purview of the Commercial Department (which a director or executive director usually oversees).

The survey questions covered several categories: company information, target setting and objectives, individual incentive scheme structure, and experience with that structure. Appendix A includes the full questionnaire. Once the Team received the responses, the Team’s subject matter experts conducted an interview (if required) to clarify any responses and ask in-depth questions of utility representatives. Those interviews and survey responses, along with primary research from the Team’s SMEs, form the basis of this report.
2.3 OVERVIEW OF SURVEY PARTICIPANTS

The Team received responses from 14 global utilities, most of were established regional leaders in loss reduction. Figure 6, below, summarizes basic corporate information on these 14 utilities.

Figure 6: Overview of Utility Participants

<table>
<thead>
<tr>
<th>Utility</th>
<th>AES</th>
<th>CESC</th>
<th>CODENSA</th>
<th>CEMIG</th>
<th>ESKOM</th>
<th>EKO</th>
<th>EPM</th>
<th>Ibadan</th>
<th>IDECO</th>
<th>MP DISCOMs</th>
<th>MSEDCL</th>
<th>TPDDL</th>
<th>UHVBN</th>
<th>Umeme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Brazil</td>
<td>India</td>
<td>Colombia</td>
<td>Brazil</td>
<td>South Africa</td>
<td>Nigeria</td>
<td>Colombia</td>
<td>Nigeria</td>
<td>Jordan</td>
<td>India</td>
<td>India</td>
<td>India</td>
<td>India</td>
<td>Uganda</td>
</tr>
<tr>
<td>Employees</td>
<td>8,798</td>
<td>10,000</td>
<td>6,000</td>
<td>7,860</td>
<td>41,787</td>
<td>2,292</td>
<td>3,200</td>
<td>1,300</td>
<td>11,085</td>
<td>71,312</td>
<td>3,547</td>
<td>1,384</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Served</td>
<td>20M</td>
<td>2.9M</td>
<td>2.9M</td>
<td>8.1M</td>
<td>5.7M</td>
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<td>1.8M</td>
<td>1.5M</td>
<td>500k</td>
<td>3.2M</td>
<td>22M</td>
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<td>950k</td>
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<td>Private</td>
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</tr>
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<td>Aggregate Loss Levels</td>
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<td>11.55%</td>
<td>7.10%</td>
<td>7.63%</td>
<td>6.43%</td>
<td>35.10%</td>
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<td>11%</td>
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<td>15%</td>
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<td>Access to Electricity (%)</td>
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<td>79.2%</td>
<td>97.8%</td>
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<td>86.0%</td>
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<td>100.0%</td>
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<td>79.2%</td>
<td>100%</td>
<td>79.2%</td>
<td>20.4%</td>
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<tr>
<td>Stand-alone Loss-Reduction Group</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>Loss-Reduction Targets</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

11 Gray boxes represent areas where data was not provided by the utility company and it was not available through secondary research.
12 1,818 Permanent staff and 474 outsourced staff.
13 North and Northwest Delhi
14 PPP Model
15 TPDDL provided electricity access levels specific to the utility’s service area.
3. FINDINGS—TYPICAL INCENTIVE SCHEME STRUCTURES

This section discusses the foundations required to build a successful loss-reduction incentive scheme within a utility company. It then introduces the types of incentive structures identified by the survey, describes their unique characteristics, and discusses the factors that enabled or impeded their implementation. This analysis is supported by documented case studies from the utility companies surveyed. Appendices B and C provide further information on the detailed methodologies associated with these sample incentive structures.

Building from this initial analysis, the Team developed a maturity model to assist practitioners in assessing utility readiness for different types of incentive schemes. This maturity model can be used to operationalize incentive structures and determine their applicability to a specific country or utility context, thereby simplifying the selection of case-appropriate utility loss reduction systems, processes, and technology.16

3.1. CREATING A CULTURE OF LOSS REDUCTION

Corporate culture - the beliefs and behaviors that determine how a company's employees and management interact with and handle business transactions - is an important part of any organization. Often, corporate culture is implied, not expressly defined, and develops organically over time from the cumulative traits of the people the company hires.

The Team found that a utility's corporate culture is a critical, foundational element of its ability to implement incentives for loss reduction. The actual reduction of non-technical losses is dependent on the activities of employees. To that end, many of the utilities that the Team interviewed encourage competition among employees and individual recognition for employees who exhibit remarkable performance by offering prizes and acknowledgement on a monthly basis.

Some utilities, such as AES Eletropaulo (Brazil), have established incentive schemes to specifically recognize those employees who make significant contributions to loss reduction. Financial or nonfinancial awards are provided to recognize: innovative suggestions for process improvement; exemplary security behavior; exhibiting integrity in situations of attempted corruption; maintaining a proactive attitude toward problem-solving problems, and; building constructive relationship with customers and communities. These types of incentives come in the form of spot awards, official recognition, or nonfinancial awards (i.e., technical courses or smart phones and/or other personal electronics).

16 Process: Generally focused on meter, billing, and collection processes supporting clear monitoring and minimizing revenue leakage. Often reengineered to minimize customer touch-points and potential for corruption. Systems: Create mechanisms for systematic and objective business and performance review comparing KPIs to goal metrics. Technology: Examples include prepaid meters, meter reading technology, or HR data repository and review management tools. All processes, systems, and technology should be designed to support each other, aligning incentives for employees.
3.2. THE ROLE OF THE REGULATOR IN LOSS-REDUCTION PROGRAMS

All of the utilities the Team surveyed exist in countries that have both an electricity sector regulator and an existing body of performance-based regulation. In most cases, the regulator determines reasonable loss-reduction targets as a part of its periodic update to the electricity tariff. The Brazilian, Indian, and Jordanian utilities are all subject to performance-based regulations that incorporate some (but not all) losses into the rate calculation. These tariff rates assume some revenues are invested in loss-reduction initiatives, and establish a reasonable course for reducing losses over time. If a utility company does not reach the targets established by the regulator, the company will lose money. Conversely, if the company is able to reduce losses more quickly than the tariff calls for, the utility will be able to keep the additional profits. This type of performance-based mechanism allows for the fact that many developing-world utilities have high technical and non-technical losses, as well as limited resources with which to improve their processes. More broadly, the logic behind the performance-based approach is that losses and bad debts affect the utility’s cost of service, which may result in tariff increases for all consumers.

This is not to say that effective loss reduction is wholly, or even significantly, dependent upon the terms of a utility’s regulatory mandate. Power companies can still move forwards with basic incentive schemes, even in the absence of a conducive regulatory environment; indeed, the nature of electricity losses gives utility companies an inherent incentive to minimize them. However, a performance-based tariff structure can give utilities facing difficult circumstances a more credible platform to set loss-reduction targets and put in place employee incentives to achieve those targets.

3.3. TYPES OF INCENTIVE SCHEMES

The Team observed a wide range of loss-reduction HR incentive schemes. Program differences tended to be driven by an individual utility’s ability to collect internal and external data about employee performance, the scale and location of its losses and, in turn, sequence that data into the design of the program itself.

The Team identified three main types of incentive schemes. Each type of program requires a different level of institutional maturity, as defined by the relative sophistication of the target utility’s systems, processes, and enabling technologies. As a utility’s loss-reduction function and HR department mature, the incentive structures used may change to reflect increased data availability, improved institutional capacity and the results of prior initiatives. From relatively basic to more complex, the three types of incentive structures are:

**Recognition-Based Incentive Schemes**

Recognition-based incentive schemes were generally the first types of rewards programs that the Team observed utilities implementing as they rolled out loss-reduction programs. Recognition-based rewards were seen as low risk, since they do not require a sophisticated HR function, and rely on the satisfaction gained through recognition (social gratification). Recognition-based incentive schemes also minimize program-based corruption risks, because there is no financial component for employees to manipulate.
Utilities can choose to recognize employees as individuals or as groups. For example, numerous Indian utilities, and the Ibadan Electric Company in Nigeria, award a trophy to the best-performing loss-reduction business unit. As a utility’s HR function becomes increasingly sophisticated, recognition-based programs continue to be an effective motivational tool, because employees value benefits tailored to their interests. Additionally, employees value the potential career acceleration such an award can confer. While career progression does not come with an immediate monetary benefit, the incentive scheme acts as a way to identify high-performing employees in a low-risk way that may enable them to be promoted more quickly. Ultimately, employees engage in these types of programs because they value the benefits of promotion, potential upward mobility, enhanced responsibility, and/or greater visibility with management. Individual rewards might include performance certificates, an employee of the month award, and/or an award for a significant individual contribution.

Popular benefits include traveling to a loss-reduction conference, recognition at a company awards ceremony, or admission to a training or certification program. Employees generally valued training programs and trips as part of development initiatives for high-performing individuals; employees at AES Eletropaulo and TPDDL (India) were particularly outspoken in their support of such benefits. Some South American utilities noted that electronics, phones, and other consumer goods were highly coveted prizes for their staff. In general, nonmonetary rewards programs at utilities with a more mature HR function were less widespread, and they were normally aimed at specific groups or utilized for a specific purpose (i.e., soliciting papers for a conference).

Recognition-based reward programs are the simplest incentive schemes to implement, require the least sophisticated HR function and the minimum level of corporate financial commitment. Many utilities begin with nonmonetary rewards programs before evolving their incentive structure into something more sophisticated. That said, mature utilities continue to refine the application of nonmonetary rewards, and often use tailored rewards programs to stimulate competition and accelerate closely-defined improvements. All utilities the Team surveyed had instituted some kind of recognition-based reward system.

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17 Note: A utility’s HR function may also have to take punitive action to combat negative behaviors, but that function is generally outside of any rewards program.
Recognition-Based Rewards Scheme in Madhya Pradesh West DISCOM

Madhya Pradesh West DISCOM was incorporated as an independent entity in July 2002. The utility initiated a nonmonetary rewards scheme to reward employees who show exemplary behavior and performance per defined criteria. This nonmonetary rewards program covers both individuals and teams.

As part of the team rewards scheme, the utility defined a methodology to evaluate the performance of field offices using the following parameters:

1. Revenue per input unit
2. Distribution transformer (DTR) failure rate

The steps for performance evaluation were as follows:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Formula</th>
</tr>
</thead>
</table>
| **Revenue per Input Unit** | Steps for calculation:  
  • On achieving 90% of the target the company/circle/division office set—0 points  
  • For every 1% over and above 90% of the target—1 point  
  At the end of the financial year, the cumulative score of the circle/division/unit would be added up to identify the score it achieved in this parameter. |
| **DTR Failure Rate**       | Steps for calculation:  
  • On achieving a 1% to 5% decrease in transformer failure rate (%) (YoY basis)—1 point  
  • On achieving a 5.01% to 10% decrease in transformer failure rate (%) (YoY basis)—2 points  
  • On achieving more than a 10.01% decrease in transformer failure rate (%) (YoY basis)—3 points |

The field offices that achieved extraordinary performance and also achieved the highest score were given a shield (or a plaque recognizing their accomplishment). Similarly, HR developed an individual recognition scheme to recognize, reward, and motivate individual employees who showed outstanding performance in certain areas. In these programs, the individuals from the best-performing teams, which receive a “shield” (plaque), also receive certificates of merit as part of the program. Teams must have had an impact in the following areas of the DISCOM performance:

- System/process improvement
- Successful completion of special assignments
- Employee suggestions adopted
- Problem-solving initiative

Example of Activity-Based Rewards Programs
Activity-Based Loss-Reduction Incentive Schemes

As a utility gains more visibility into the value of its loss-reduction operations, it can more easily attribute value to the efforts of its teams (or individuals) in combatting losses. As such, the utility’s HR function can begin to use targeted monetary rewards to encourage specific employee behaviors. Activity-based incentive schemes offer monetary rewards to employees or teams for specific and quantifiable loss-reduction interventions. The primary difference between an activity-based and recognition-based program is that activity-based programs offer monetary rewards. Activity-based loss-reduction incentive schemes are typically designed for the express purpose of motivating employees to take specific and easily quantifiable actions designed to reduce losses.

EPM in Colombia and IDECO in Jordan have implemented excellent examples of activity-based loss-reduction incentives. EPM has even implemented an incentive scheme that rewards contractors with financial bonuses for the number of successful antitheft raids and the volume of collections of arrears. Appendix B contains detailed methodologies and example calculations from EPM and IDECO’s incentive schemes. They are both focused on a rewarding individuals and business units for achieving goals and/or reaching a particular threshold on specific aspects of their company’s loss-reduction and revenue enhancement goals.

Activity-based loss-reduction rewards are compatible with relatively basic HR systems, since they are linked to tangible, quantifiable data and loss-reduction outcomes. Since these types of incentive schemes are often a utility’s first attempt at a financial bonus program, managers should take care in designing the stated incentives, as poorly designed programs can lead to perverse outcomes (further described in Section 3.5). Even though the HR and oversight requirements of activity-based loss-reduction programs are relatively straightforward, they are not minimal, and it is important such schemes are effectively managed; if a utility has only just started to build its HR function, and has yet to standardize most business processes, recognition-based programs are probably more appropriate in the immediate term.

IDECO (Jordan) — Employee incentives are disaggregated and different based on employee job classifications. Workers in the field have incentives based on physical targets (i.e., instances of theft identified and addressed) while managers’ incentives are based on achieving aggregate goals of reducing losses, and recovering revenue. (A detailed calculation is available in Appendix B.)
Variable Pay or Performance-Linked Pay
Incentive Schemes

Variable pay is a monetary reward system in which multiple aspects of an individual’s overall performance are weighted and rated relative to a set performance rubric based on the employee’s job description. Due to the complexity of measuring and setting performance targets, variable incentive plans require mature business processes to be in place, including well-defined employee positions and business review processes. In variable compensation programs, the bonus payout is typically a percentage of an individual’s fixed salary, pegged to a predetermined performance rating scale. For example, performance pay as a percentage of fixed pay may range from 0 percent to 20 percent relative to a performance rating scale of 1 to 5. In most instances, however, loss reduction is usually only one key performance indicator (KPI) measured during individual performance assessments, even for metering, billing, and collections (MBC) personnel who are wholly focused on one aspect of the loss reduction cycle.

Under the balanced scorecard approach, measures of business performance are considered in the overall performance assessment of an individual and tied to their individual compensation. Advanced utilities, such as TPDDL, CESC, and AES Eletropaulo, have adopted a balanced scorecard approach for their personnel and include several categories related to that individual’s—or that individual’s business unit’s—performance on losses. This requires a utility to have a robust HR function, clear goals and expectations, and clearly defined processes that management can use to evaluate performance in a fair and balanced manner.

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Example of Performance-Based Rewards Programs

TPDDL (India) — One of the leading companies in the region on loss-reduction, TPDDL utilizes a performance pay per individual performance appraisal structure. In their program, individual performance, across the organization, is measured and evaluated on a five-point scale based on achievements in balanced scorecard categories—financial, customer, internal process, and learning and growth.

TPDDL’s company level balanced scorecard includes AT&C loss as a KPI (included under the financial scorecard category). This company level balanced scorecard and associated KPIs are applied to internal departments and field offices as annual targets. Thus AT&C loss is not a standalone KPI that is measured, but an integral part of the overall performance assessment of a department/field office.

Thus, this structured performance management system (PMS) facilitates the measurement of achievements of KPIs. Performance pay is based on the individual’s and field office/department’s overall performance the financial year, based on metric weights from the scorecard. TPDDL’s advanced incentive structure should be evaluated in the context of its financial and institutional capacity. In comparison to many of its peer utility companies, TPDDL is privately run and well-funded as a member of the Tata conglomerate. After its restructuring and privatization in the early 2000s, it also has a high level of institutional capacity and capable staff. Notably, TPDDL was the 2008 winner of the Palladium Balanced Score Card “Hall of Fame” Award.

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18 A balanced scorecard is a performance metric used in strategic management to identify and improve various internal functions of a business and their resulting external outcomes. It is used to measure and provide feedback to organizations.
Several Indian utilities (MSEDCL, Madhya Pradesh DISCOMs, and UHVBN) have variable pay incentive schemes that set quantifiable loss-reduction targets at the business unit level and then pay out incentives to each individual in the unit based on that person’s salary and the percentage of the loss-reduction target that the unit is able to achieve. The specific metric varies depending on the company’s nuanced non-technical loss challenge and that department’s role in the company. Appendix C contains the detailed variable pay methodology and approach for MSEDCL and the Madhya Pradesh DISCOMs.

Ultimately, these types of variable pay structures require a significant amount of reliable data and a relatively sophisticated HR function in order to attribute results and determine appropriate rewards for employees.

**Overview of Types of Incentive Scheme Structures**—Figure 8, below, summarizes the three identified forms of non-technical loss reduction incentive scheme, the key characteristics of each, illustrative impacts on loss reduction, and sample locations where each form has been implemented.

![Figure 8: Overview of Key Characteristics of Incentive Schemes (Repeate](#)}
<table>
<thead>
<tr>
<th>Category</th>
<th>Key Characteristics</th>
<th>Impact on Loss Reduction</th>
<th>Utilities</th>
</tr>
</thead>
</table>
| **Activity-Based Loss Reduction Incentive Schemes (Monetary)** | More developed programs that offer monetary rewards to employees or teams for the accomplishment of specific, measurable loss-reduction activities based on pre-determined criteria; these programs are normally stand-alone activities or dedicated company efforts.  
- Utilities facing high losses use these programs as a measure to directly stimulate loss reduction.  
- Rewards may be based on the completion of an activity related to loss reduction or the final outcome of such programs.  
- Three kinds of incentive payout:  
  1. Fixed sum for completion of activity (e.g., number of raids conducted)  
  2. Defined percentage of additional cash collected on account of loss reduction  
  3. Defined payout on achievement of target reduction | - Such incentive schemes have had mixed results and are effective when the incentive payout to the employees involved is sufficient.  
- Poor design can lead to unrealistic target-setting and misreporting of data impacting the success of such schemes. Proper performance review and verification of the actual loss level is important.  
- If implemented well, such schemes can bring losses to a manageable level, which can then be sustained using a well-defined performance-linked rewards scheme.  
- Some utilities have used these types of incentive schemes to incentivize contractors to assist in loss reduction efforts. | * IDECO in Jordan, EPM in Colombia, and others. |
| **Variable Pay or Performance Linked Pay Incentive Schemes** | The most developed reward program, in which aspects of an individual’s overall performance are weighted, rated, and monetarily rewarded relative to a performance rubric that includes loss reduction and related goals; these programs are normally part of a comprehensive approach.  
- Requires a mature organizational PMS to be implemented (well defined roles, processes, and strong HR function).  
- Balanced approach to performance—a diversified portfolio of KPIs measure performance, of which loss reduction is one, but other aspects such as O&M performance, process improvement, and people-based milestones also have defined weights.  
- KPIs need to be defined and cascaded from dept. and work unit performance metrics to individual’s performance score card.  
- Requires adequately well-defined and planned business processes and adoption of technology to manage the process.  
- Paid to employee after conduct of an objective annual performance assessment. | - This category of incentive scheme rewards both the processes of loss reduction and the outcome of their efforts.  
- It rewards holistic performance which goes beyond loss reduction.  
- While the incentive scheme may not always directly reward loss reduction, successful implementation helps sustain loss reduction over a period of time by bringing attention to loss reduction metrics which affect an employee’s overall evaluation. | * AES Eletropaulo and several Indian utility companies including: CESC, two MP DISCOMs, MSEDCL, and TPDDL have adopted performance linked pay program. |
### 3.4 COMMON STRUCTURES OF ACTIVITY-BASED AND VARIABLE PAY INCENTIVE SCHEMES

The majority of the surveyed utilities had implemented some form of financial incentive scheme to motivate their employees to improve the company’s loss-reduction performance (either activity-based incentives or variable pay structures). The payout calculation differed depending on the program, its goals, and the specific loss-reduction challenge. A variable pay program was generally based on overall company profits, business unit results, and the individual performance of the employee. Activity-based programs generally only incorporated metrics related to specific loss-reduction activities. Example program payout calculations from EPM (for an activity-based incentive scheme) and MSEDCL (for a variable pay program) are detailed in Appendix B and C, respectively. Several of the common aspects of financial components of the incentive structures follow include:

- **METRICS AND GOAL SETTING**: In variable pay structures, the value of the bonus typically depends on three sets of KPIs: company results, department level results, and individual performance metrics. Generally, these KPIs directly relate to the strategic objectives and targets set by leadership. Company results are applied to all employees. Department level indicators are applied to all employees of a specific department, and individual indicators are specific to each employee. For example, in CODENSA and AES Eletropaulo’s loss-reduction incentive schemes, employees who work directly on loss reduction have at least 70 percent of their performance indicators tied to loss mitigation actions and results.

- **SETTING A CAP FOR BONUS VALUE**: A maximum value of bonuses is typically established in months of salary (e.g., one-to-seven months) or percentage of the annual remuneration (e.g., 10-to-60 percent), depending on the individual evaluation of each employee. This range can vary depending on the position of the employee in the company. In some state-owned companies, such as EPM (Colombia) and CEMIG (Brazil), the bonus value for operational employees is negotiated with the labor union and is a mutually agreed-upon fixed value. A fixed value bonus can also help limit perverse incentives stemming from disproportionally large bonus structures.

- **PAYMENT IN PROPORTION TO GOAL ATTAINED**: Some utilities, such as CEMIG, use a simple structure that pays a fixed bonus by organizational position for all employees and applies the bonus directly, relative to KPI results. Such incentive schemes have rules to define the final value of bonuses based on how fully goals were met. For example, if the group or individual reached 70 percent of the goal, the employee will receive 70 percent of the possible bonus. This tends to be more common in activity-based incentive structures.

- **FREQUENCY**: There is normally a predetermined time period in which a company pays out incentives to employees. Management typically pays variable incentives once per year, or in line
with review cycles. Activity-based incentives can also be paid annually, but are more commonly paid in shorter time intervals as they are often tied to specific programs or interventions.

- **EMPLOYEES VERSUS CONTRACTORS:** Oftentimes, utilities employ different financial payout structures depending on the type of staff member they are trying to motivate. Incentive structures aimed at contractors are often more financially-based than for employees within the organization. Incentives for employees tend to be more aligned to company values and loss-reduction goals. In South America, where many field-inspection crews belong to third party providers rather than host utilities (AES Eletropaulo and EPM), activity-based incentives are more nuanced. In these examples, the utility pays out a bonus to both the employees of the third-party company and to the company itself, according to the success rate in identifying fraud, as well as the volume of electricity returned by regularizing those frauds. This creates a transparent reporting structure between the contractor and the utility, incentivizes the contractor’s leadership and employees to monitor and participate in activities, and aligns incentives to the contractor’s reputation for investigating theft.

### 3.5 Pitfalls and Challenges of Financial Reward Systems

Incentivizing employees with purely financial compensation can sometimes lead to unintended consequences. For example, surveyed utilities often employed a structure that paid out a bonus to individuals based on a combination of the total number of inspections done and hit rate per inspection. This structure tended to create an incentive for employees to inflate their metrics (i.e. falsely report the number of illegal connections identified) in order to receive the proposed bonus.

There can also be issues balancing and communicating the reasons for different levels of financial compensation across the utility. Some utilities in South America have even gone as far as to discontinue activity-based incentive schemes altogether, due to internal conflicts, counterproductive behavior by employees, labor union issues, and other unforeseen circumstances. In most cases, however, after careful monitoring of behaviors and adjusting the payout structure as required, it was possible for most utilities to realign the incentives to motivate appropriate staff behaviors.

IDECO in Jordan is an example of a utility that had issues with perverse incentives in its activity based incentive scheme. At its inception, IDECO’s activity-based incentive scheme had no cap on the bonuses

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19 “Hit rate” refers to the number of illegal connections identified during an inspection shift by an individual or a team.
paid for the identification of theft and meter tampering. In 2013, the company found that an employee had been deliberately tampering with meters in order to later return and identify them, thereby nearly doubling his yearly salary. To correct for this misalignment, the incentive system was capped at a maximum payout of five months’ salary, employees were reprimanded for counterproductive behaviors, and spot checks were put in place to minimize future abuses of the system. This example illustrates the importance of iterating on program design, as well as carefully understanding what behavior the program might promote, before fully implementing it.

Variable pay incentive schemes also come with challenges. In most utilities that had a variable pay incentive scheme, at least part of the bonus criteria (and associated rewards) was standardized for all employees at the company. Failing to create clear and well-defined rewards structure can create a sense of frustration for employees who do not grasp why employees who exceed results in high-priority areas receive the same amount of bonuses as an employees who exceeds results in lower-priority areas. The goals set for different divisions and subdivisions are often not proportional, thereby making it difficult to attract employees to areas that require a high level of effort to reach performance goals.

### 3.6 Aligning to the Maturity Model of a Utility’s HR Function

Deciding on a specific incentive scheme is a complex and involved process. The “right” type of incentive scheme depends on a number of factors, but—perhaps most significantly—it relies on the amount of data available to the utility’s HR function and the company’s institutional capacity to manage that data.

Based on the survey and interviews conducted, the Team found it was not possible to make a quantitative determination of the impact of each type of incentive scheme. Indeed, in many cases, the quantitative outputs from incentive-program and loss-reduction initiatives are proprietary and were not available for study. Furthermore, utilities rarely implement such programs in isolation, making it difficult to pinpoint direct results. With limited information that is highly dependent on context, the Team instead developed a model to simplify the process of identifying and aligning appropriate non-technical loss reduction incentive structures with the relative capacity of an individual utility’s HR function.

As a utility’s processes, systems, and technology become more sophisticated, the organization generates a larger amount of relevant performance data that can be used to measure impact and incent positive behaviors. As the tools that a utility uses become more sophisticated, its ability to tailor incentives to individual employees and business units increases. With increased visibility into operations and more nuanced oversight of their people and processes, utilities can more effectively target losses and improve company results.

The strengthening of these institutions typically manifests in a reduction in AT&C losses over time. Reported non-technical losses from the surveyed utilities over the past three years are shown in Figure 9, below. As the figure illustrates, companies with more sophisticated internal systems, like those at Tata Power Delhi Distribution Limited (TPDDL), are able to reduce non-technical losses with more complex incentive structures as a component of a broader loss reduction portfolio. TPDDL is a mature utility that has been able to implement a loss reduction incentive scheme incentivizing employees with variable pay tied to employee loss reduction metrics.
Capacity building has been an essential part of TPDDL’s loss reduction strategy. Employees in management, technical, commercial and consumer related functions are constantly trained in the current leading practice in electricity distribution, loss reduction, theft, and pilferage control within India and abroad. TPDDL reinforces these lessons with an incentive scheme for staff designed to link rewards to achievements of AT&C loss targets.

Historically TPDDL has overachieved the AT&C Loss targets set by the Indian regulator. Because AT&C Loss reduction adds to TPDDL’s bottom line, the company shares these benefits with employees through a tailored incentive program. TPDDL has defined performance metrics for each position within the organization in very specific, objective, quantifiable terms to enable effective performance

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20 While the Team received data from most of the utilities surveyed, Figure 9 only shows those companies with non-technical losses beneath 15% in order to provide enhanced granularity and detail for the more advanced utilities. Losses for Ibadan Electric Distribution Company (Nigeria) and Eko Distribution Company (Nigeria) are 39.2%, 38.5%, 35.1% and 45%, 49.1%, 50.5% respectively over the same time period. The utility companies (IDECO, Codensa, CEMIG) that show a slight increase in non-technical losses had all put in place new methodologies to capture their non-technical loss results. The survey queried utilities for the last three years of AT&C losses.
measurement and tracking. Each employee is informed of the performance metrics, and incentive benefit calculations relevant to his or her position in a very transparent manner. TPDDL’s organizational results have been possible through deployment of Balanced Score Card and has been pushed down to all employees through a departmental scorecard, Key Result Areas (KRAs) and other tools. TPDDL has found that their scheme of performance pay has been positively associated with job satisfaction, organizational commitment and overall trust in management.

Outside of political, regulatory, and resource constraints, the decision on the type of incentive structure to implement depends on the amount and quality of the data available to the utility’s HR function and the HR function’s ability to use that data to direct loss-reduction behaviors (i.e. the utility’s relative position on the Incentive Scheme Maturity Curve). In Figure 10, below, the Team illustrates this concept for multiple utilities by plotting the amount of data incorporated into a loss-reduction scheme against the utility’s high level profit and loss levels.

*Figure 10: Loss Reduction—Incentive Scheme Maturity Curve (Repeated from Figure 2)*

Below the x-axis, the diagram also shows the three types of incentive structures, illustrating how more complex structures can be gradually adopted as utility HR functions becomes more capable of integrating data into decision-making. Progress along the maturity curve requires the streamlining of utility processes, the optimization of business review systems, and improved integration of appropriate technologies solutions – all while developing the internal capability to manage relatively complex incentive schemes.

This Incentive Scheme Maturity Curve can help development practitioners and utility managers understand which type of incentive structures are most effective at various points in a utility’s institutional growth, and how to evolve these incentive structures as power companies improve their operations. Figure 11 below provides a general description of utilities with low, medium, and high maturity HR functionality and their corresponding incentive scheme capabilities.
**Figure 11: Indicative Organizational Maturity to Support HR Incentive Schemes**

<table>
<thead>
<tr>
<th>Maturity Level</th>
<th>Processes and Accountability</th>
<th>Systems (Review Framework)</th>
<th>Technology</th>
<th>Incentive Scheme Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td>Processes are not clearly articulated or defined in utility. Individual field units and teams operate distinctly. Lack of standard processes. Accountability: Limited or no accountability across the various elements of the distribution value chain. Overlap of roles and lack of clarity in roles at various levels.</td>
<td>Owing to limited clarity of roles, KPIs not usually cascaded to departmental or individual levels. Systems around data and management information system (MIS) flows and monitoring are not structured. Data or MIS is generated on a need basis and there are limited mechanisms to track the accuracy of data.</td>
<td>Limited or no advanced technology interventions support the utility functioning.</td>
<td>Group nonmonetary rewards are the preferred type of incentives as it is difficult to track or drive initiatives when process owners are not clearly defined and supporting data and MIS mechanisms are not available.</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Processes are clearly articulated and operate with a fair degree of standardization across various field units. Accountability to the distribution value chain exists. However, there are some redundancies and/or overlaps built by the hierarchical layers in the organisation on the processes.</td>
<td>Organisational KPIs are usually cascaded until the departmental and field unit level. MIS mechanisms exists. However, the data flow is not structured.</td>
<td>Stand-alone technological interventions (IT systems) exist.</td>
<td>Clear accountability until the departmental level and a MIS mechanism with fair degree of accuracy, loss-reduction incentives usually driven at team level on a broad set of objectives. The maturity of the utility still does not facilitate delivery of incentives or pay-outs at an individual level.</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>Processes are clearly articulated. Accountability at various levels well established and documented. Limited or no role overlaps.</td>
<td>Organisational KPIs are cascaded to department and field units and subsequently to the individuals. (As part of the PMS). MIS mechanisms including dashboards at various levels of the key parameters are available.</td>
<td>Integrated technology platforms/enterprise resource planning (ERP) systems facilitate day-to-day functioning in the utility.</td>
<td>An individual PMS based on unique employee metrics is possible in the utility.</td>
</tr>
</tbody>
</table>
4. APPLICATION—LAYING THE GROUNDWORK FOR INCENTIVE SCHEME SUCCESS

4.1 FOUNDATIONS OF MATURE UTILITY INCENTIVE SCHEMES

The Team’s research showed there were a series of preconditions aligned to the maturity of a utility’s HR function that can accelerate the effectiveness of incentive schemes. These preconditions can help a utility to best align its strategic focus, business processes, performance review cycle, organizational structure, performance management, and rewards program to its company goals. Logically these steps build upon one another, and enable a utility company to move along the maturity model towards increasingly sophisticated incentive structures. Figure 12, below, illustrates the basic components that a utility should have in place before implementing a multidimensional HR incentive scheme.

![Figure 12: Foundations of Mature Utility Incentive Schemes](image)

The extent to which a utility has established these preconditions and the interlinkages between them was observed to be a critical factor in the success of any HR incentive structure. The Team found that those utilities that implemented successful incentive-driven loss-reduction programs had consistently expanded their HR functions well before such programs were inaugurated. While some utilities did implement incentive schemes as stand-alone initiatives, many of these subsequently found that they did not have access to adequate data to make appropriate performance determinations.

The steps listed below can help to focus utilities on creating the kinds of quantitative and data-driven processes needed to advance along the maturity curve and promote more complex HR incentive structures:

- **CREATE A STRATEGIC FOCUS AND BUSINESS PLAN**

  Given the nature of system losses, loss reduction is by definition a strategic driver of corporate profits for any power utility. In all cases that the Team observed, utility leadership created a strategic focus on loss reduction at the outset of any programming. Such initiatives start at the top, but then filter down as leadership defines and solidifies processes and organizational structures. Without a clearly defined organizational goal, it is impossible to align performance to reach that goal. Goals can be set at a high level, but should be based on empirical data, and, as such, should be reasonably attainable.
• **REENGINEERING PROCESSES AND IMPLEMENTING SUPPORTING TECHNOLOGY**

Defining clear and repeatable processes is a primary step to achieving non-technical loss reduction and putting in place HR incentives to deliver on them. Process reengineering aims to create efficiencies through the standardization of operating procedures; the type of initiatives that often go hand in hand with the adoption of new technologies or improved data gathering and analysis. Business-processes reengineering is typically first aimed at the MBC cycle, with a focus on putting in place transparent processes that reduce direct utility employee/customer contacts and automate processes.

Without defined roles and processes for loss reduction, evaluating employee performance relative to goals is difficult, if not impossible. Loss-reduction programs need to have clear, distinct, transparent, data-driven foundations to be successful and compensate employees appropriately for achieving company goals.

• **BUSINESS PERFORMANCE REVIEW**

Business performance review is focused on monitoring the execution of standard operating procedures to make sure they achieve company goals. As with all procedures, mechanisms to drive non-technical loss reduction also need to be closely monitored to ensure they achieve required results, as illustrated in Figure 13, below. Only after the company has institutionalized a business review framework should it begin to roll out incentive schemes.

![Figure 13: Key Elements of a Business Review Framework](image)

Some utilities have implemented incentive schemes without a structured framework to track and review key MIS data; such an oversight eventually compromised the legitimacy of the entire reform program. Even in utilities where appropriate MIS mechanisms and data collection are in place, the validity of the data can be questionable. For example, in Rajasthan, India, a utility MIS department collected performance review data regularly in complex templates, but did not review it for validity at any point in the process. As a result, when the utility attempted to implement incentive schemes for loss reduction, it discovered the initiative lacked credible data upon which to benchmark itself. The loss incentive initiative had to be deferred as a result. On the other hand, other Indian utility companies, such as the Manipur State Power Distribution
Company Limited (MSPDCL), have implemented a data review mechanism systematically and effectively, setting a foundation for a successful incentive scheme.

- **ORGANIZATION RESTRUCTURING AND ESTABLISHING ACCOUNTABILITY**

The interface between process owners within a department should be clearly defined, with straightforward reporting relationships and a delineation of roles and responsibility. Setting up a clear reporting structure creates transparent expectations and measurable outputs based on roles. With explicit organizational roles and responsibilities, individual performance can be more easily measured, and departments aligned with operational targets. Key organizational roles for loss-reduction programming are normally housed with the distribution department, which is typically the largest department at a utility company, and include the following sub-units:

**CENTRAL COMMERCIAL COORDINATION AND MONITORING TEAM:** This team coordinates and monitors the entire process of non-technical loss reduction, often linking it to revenue goals. It typically reports to the commercial department lead. The team is made up of specialized professionals responsible for all of the company’s inter-related loss-reduction tasks. This can range from identifying the cause and location of losses to defining the KPIs of an action plan, rolling out the loss reduction strategy across the organization, and periodically auditing the process for sustainability.

**REVENUE PROTECTION TEAM:** This team includes professionals from all areas of the company involved in the revenue cycle, preferably coordinated by the manager responsible for losses. The purpose of this team is to evaluate problems in commercial processes that affect the revenue cycle and result in a loss of revenue. The revenue protection team provides recommendations to mitigate and improve these problems and processes. This team should include professionals with extensive experience in revenue cycle activities, including MBC.

**COMMERCIAL OPERATIONAL TEAMS:** These teams are composed of field-based employees tasked with leading local inspections to identify fraud, meter anomalies, meter by-pass, and unauthorized direct connections. These operational personnel are responsible, among other tasks, for managing meters to ensure proper functioning, conducting monthly readings of the customer consumption, and maintaining the supporting distribution infrastructure.

A clear organizational structure is fundamental to the successful implementation of an effective incentive scheme; only when all employees or process owners have clear roles and responsibilities and follow well-designed procedures, can staff be objectively evaluated on their performance.

- **PERFORMANCE MANAGEMENT**

To create objectivity in a Performance Management System (PMS), a company needs to define a transparent performance framework and institutionalize individual performance metrics publically based on KPIs. PMSs need to be comprehensive, with defined periods for review and marked times for performance recognition. Performance metric categories should define individual process owners’ responsibilities with quantifiable targets and a clear methodology on how to accomplish those KPIs. At this stage, the specific categories for KPIs and their scoring
range are normally robust, based on industry standards, and cover multiple aspects of performance. To institutionalize a loss-reduction incentive scheme, several of these KPIs should be related to specific, detailed aspects of the company’s loss-reduction program. A balanced scorecard-based performance payout can link incentives to loss reduction in many ways over a sustained period by focusing on both the process and the outcome. Based on the experience of leading utilities like AES Eletropaulo, EPM, TPDDL, and CESC, performance-related pay can sustain improved business performance long term.

**REWARDS AND INCENTIVE SCHEME DESIGN**

The Team found that all of the utilities surveyed had implemented some form of an employee incentive scheme, and those that had successfully put in place more advanced structures not only had these processes, systems, and technologies in place, but were rooted in the culture and nuances of their company. Some utilities in India that have implemented schemes based on the experiences of other utilities have not necessarily seen the same level of success. This is because successful incentive schemes are attuned to the context and maturity of a specific organization. For example, TPDDL and one of the MP DISCOMs witnessed different degrees of success with respect to the incentive scheme implementation. This was mainly due to the fact that TPDDL’s systems and processes were more mature than those of MP DISCOMs. Also, TPDDL’s KPIs and targets followed a balanced scorecard approach and targets were set every year based on an internal and external assessment. In case of one of MP DISCOMs, stiff performance targets were set which the departments and employees were not able to achieve, leading to reduced impact of the incentive scheme. Thus, the success of incentive schemes depends on the maturity level of the organization and whether realistic targets are set for employees to achieve. The more mature a utility is, the more capable it will be in adapting successful external incentive schemes to its own needs.

**5. RECOMMENDATIONS—INCENTIVIZING LOSS REDUCTION**

All surveyed utilities recognized the importance of incentivizing their employees. There is a wide array of factors that shape how a power provider may choose to implement incentives to mitigate non-technical losses. As such, utilities will have to tailor the details of an incentive structure to fit their own circumstances in a progressive, iterative process. While utilities may be able to focus on new issues once they reach more advanced levels of maturity, the process of mitigating non-technical loss evolves as customers invent new ways to circumvent a utility’s safeguards, systems, and technology. Similarly, employee preferences and norms evolve as the utility changes over time. Utilities should be prepared to adjust as they learn more about the challenges they face, the customers in their service area, or new ways to incentivize their employees.

While the incentive schemes that the Team reviewed varied significantly in their operational details, there were several commonalities and leading practice approaches that consistently appeared across all utilities surveyed, including:

**LEADERSHIP FOCUS ON LOSS REDUCTION**—Utility representatives felt that including company-level metrics and goals was important because they signal to the entire organization, not only the importance of combating losses, but also the commitment of top management to the process. The latter is
fundamental for robust employee engagement across the company. All utilities in South America noted in interviews that at least 30 percent of the indicators used in variable pay incentive schemes should be strategic organizational indicators, as defined by utility senior management. The majority of utilities surveyed noted that the time and attention of top management was a key motivational factor for employees working on loss-reduction efforts.

GATHER THE BASICS—Before structuring an action plan, utilities should gather data from multiple sources - surveys, customer outreach initiatives, and other market intelligence work - to understand the root causes of their loss problems. All too often utilities or other stakeholders view off the shelf solutions as a panacea for loss-related issues, without considering the full spectrum of factors at play.

Fully understanding the answers to the following key questions can help utility leadership to improve its chances for success in loss-reduction programming:

- What are the root causes of non-technical losses and the motivations of customers?
- How is the utility organized internally to combat losses?
- How are staff incentivized to combat losses and search for loss-reduction solutions?
- How does the utility seek and leverage strategic partnerships?
- How does the utility engage with the public sector, including local government, the regulator, and the police?
- How does the utility engage the community it serves (especially low-income communities) to understand of the causes of losses?
- How can the utility can continue to innovate, given its previous experience and approach to non-technical losses?

CREATE A DATA-BASED APPROACH — Without research, pre-existing biases and assumptions lead utilities to choose incentives for specific-loss reduction activities rather than analyzing the issues prevalent in their service areas and designing an approach for employees to specifically tackle that problem. Working with staff to understand the causes of losses allows them to contribute to the loss-reduction process, and leverages their experience working with problem customers. The Team’s analysis clearly showed that taking a data-driven approach can help to motivate employees, establish a clear strategic path forwards for the utility, and avoid wasting resources. The highest performing utilities, such as TPDDL, EPM, and AES Eletropaulo, employ local residents of their service areas and have a multitude of community outreach programs to keep their utility attuned to the needs of their clients and communities.

SET REALISTIC GOALS AND ALLOCATE APPROPRIATE RESOURCES—A number of utility representatives noted that companies should only establish a loss-reduction target for the incentive scheme after defining the amount of human and financial resources available for that program. When a utility establishes a loss-reduction trajectory, but does not ensure that adequate resources are available, it can create significant stress for those tasked with meeting those targets. Unrealistic expectations can frustrate employees and damage organizational morale. The Team found that utilities that made the most progress towards loss reduction targets had benefitted from levels of funding compatible with those goals. Loss reduction goals should be set progressively, with increasingly higher metrics each year, while ensuring that targets do not demotivate staff. Loss-reduction goals and targets should also be tailored to the specific challenges of individual service territories. For example, in the MP DISCOMs in
India, the amount of loss reduction incentive available varied according to the level of difficulty associated with collections from a particular customer class.

**ESTABLISH CLEAR ACCOUNTABILITY**—Without clear processes, roles, and accountability, it is nearly impossible to incentivize any kind of business performance improvement. By deliberately restructuring an organization and defining employee roles, it becomes easier to enact change and improve outcomes.

**START SMALL, IMPLEMENT TARGETED RECOGNITION-BASED INCENTIVES FIRST**—For a utility that is just beginning to develop its HR function, operates at high loss levels, and has underdeveloped commercial processes, monetary reward programs may achieve limited success and could be counterproductive. In order to develop a performance-oriented culture and initiate an incentive scheme, recognition-based rewards schemes may be best to implement as a first step in challenging environments. Based on triangulated performance data and clear accountabilities, utilities can put in place nonmonetary rewards, such as recognition for the best performing business unit, or employee of the month programs. Many utilities in India and Sub-Saharan Africa use these types of schemes. For example, Eko Electric Distribution PLC has only implemented a recognition-based incentive scheme due to the relative immaturity of its internal systems and HR department. In parallel with this recognition-based system, Eko is also working to build out more rigorous business processes and robust HR functions to enable a shift to more complex rewards structures in the medium-term.

**FINANCIAL REWARDS ARE THE MOST COMPELLING**—Regardless of the size of the utility or whether it is public or private, most of the surveyed utilities indicated that they felt financial incentives tended to be the most effective means of motivating their staff. Employees felt more engaged with financial targets because incremental compensation was a tangible goal that they could earn, and because the reward had a clear, immediate impact on their lives. This effect was particularly noticeable when utilities distributed rewards directly related to the cost savings created by employees' own loss reduction work. Most surveyed utilities indicated that financial incentives are even more effective when employees have an opportunity to actively participate in the discussions that establish the strategies and goals of the loss-reduction plan. Knowing that targets are aggressive but feasible is a strong source of motivation for all employees.

**IMPORTANCE OF DEVELOPMENT OPPORTUNITIES**—Several utilities indicated that the impact of a given form of financial reward or incentive may depend on employee demographics and positions within the company. Anecdotally, some surveyed utilities noted that younger employees often valued recognition or opportunities for advancement more than longer-term employees. This aligns with other feedback gathered during the survey, which indicated that nonfinancial incentives (such as training opportunities,
invitations to participate in conferences, workplace benefits, and other forms of recognition) have become an increasingly important motivational tool for attracting and retaining younger employees fresh out of university. These motivational approaches can also be effective in public companies, like CEMIG and ESKOM, which are more restricted in terms of financial benefits.

**IMPLEMENT ACTIVITY-BASED INCENTIVES OVER THE NEAR TERM**—A utility at the outset of developing its business review functions, and still suffering from higher than normal losses, should consider linking specific loss-reduction activities to monetary incentives and assessing performance against an agreed review framework. This enables utilities to transparently and iteratively adjust incentives and metrics until they are appropriately aligned, and support a team-based approach, to achieving non-technical loss reduction goals. For example, IDECO in Jordan motivates all members of a loss-reduction team, from the lead engineer to the van driver, by focusing on several key aspects driving non-technical loss into one program and tying to it measurable financial gains. Tying the bonus to one loss-reduction initiative diffuses the initial impact on an individual’s salary, promotes employee cooperation, and helps to build a performance-based culture.

**THE IMPORTANCE OF INNOVATION**—Utilities that are able to successfully combat losses can use the lessons learned to create and harness a culture of constant improvement. Top-performing power companies contacted as part of the Team’s survey emphasized the need to pilot innovations for incentive structures with a smaller population in order to fine tune approaches and minimize risks to the utility. Such an approach is fundamental to creating a loss-reduction action plan, because it allows the utility to evolve novel approaches and avoids demotivating employees who implement untested and risky innovations. Utilities stressed that innovations must be tested and evaluated carefully to assess effectiveness prior to becoming part of a broader action plan. To this end, utilities should consider investments in pilot programs and innovations separately from investments in the broader loss reduction action plan. Such an approach promotes innovation as a risk investment, reduces expectations of immediate results, and encourage employees.

**IMPLEMENT PERFORMANCE-RELATED VARIABLE PAY OVER THE LONG TERM**—Once a utility has put the foundations outlined above in place, the way should be clear to piloting pay-based loss reduction incentives backed up by granular performance data. Such variable pay schemes can transform the HR department and culture of a utility in unanticipated ways, and iterative adjustments may be required to keep progress on track over the long term towards defined corporate goals. There are the incentive structures currently in use at the utilities that have been best able to reduce their losses and create a culture of commitment.
6. POTENTIAL AREAS OF FOCUS FOR FUTURE DONOR SUPPORT

This report has qualitatively reviewed the ways by which utility companies around the world use incentive schemes to mitigate non-technical losses. The insights gained from this analysis has enabled the Team to generate a collection of key insights, and thereby create an incentives maturity model to guide the selection of appropriate programs for utilities at all levels of operational development. Figure 14 illustrates additional potential areas where donors / development practitioners can support loss reduction incentive schemes at counterpart utilities:

Figure 14: Potential Donor Supported Activities to Promote Loss Reduction Incentives

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<tbody>
<tr>
<td>Undertake Diagnostic Study</td>
<td>Utility audits processes to understand current business processes at head- and field-office levels. Focus on understanding the leakages in the processes, especially MBC-related processes.</td>
<td>Review the existing database and information flow to identify whether accurate business performance data is available. Study how performance against targets is currently reviewed.</td>
<td>Review organizational structure and position descriptions to understand whether existing organization structure has clear process ownership and monitoring of loss reduction.</td>
<td>Review existing PMS, understanding whether system is transparent, data-driven, or prone to bias and subjectivity.</td>
<td>In line with process study, identify loss-reduction process steps that need to be incentivized in short term.</td>
</tr>
<tr>
<td>Design Pilot</td>
<td>Reengineer processes and consider technological interventions for processes that need improvement.</td>
<td>Establish a systematic and disciplined business review mechanism based on triangulated data. Ensure periodic business review.</td>
<td>Restructure organization in line with to-be processes. Establish setups to drive performance review.</td>
<td>Design a KPI-based organization and individual PMS in line with the business review framework.</td>
<td>Design short-term incentive schemes (nonmonetary or cash-based).</td>
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<tr>
<td>Capacity Building</td>
<td>Institutionalize processes and technology through training existing staff. Ensure process ownership is clearly understood and internalized.</td>
<td>Maintain disciplined business review system and engage external stakeholders ensuring transparency in review. For example, seek customer inputs in business review to improve performance.</td>
<td>Stabilize redesigned organization structure, develop training and rules for how structure is modified.</td>
<td>Roll out individual PMS once business review framework is stabilized.</td>
<td>Train management on the importance of constantly monitoring outcomes and adapting incentives.</td>
</tr>
</tbody>
</table>

Identify KPIs related to loss reduction that can be linked to incentive pay and variable pay.

Transition to KPI-based performance pay over time based on a balanced scorecard approach.
This report highlights the structures, lessons learned, and typical results from incentive schemes at 14 utility companies in very different regions of the world. USAID and other development partners can continue to contribute to the analytical development of non-technical loss reduction techniques by publishing the results of pilot programs, bringing together program managers to discuss these types of programs in more detail, and otherwise providing (and requiring) the kind of quantitative data needed to effectively evaluate reform initiatives. More data on the impact of employee incentive schemes, and the operational factors that underpin them, would greatly assist both utility companies and donors to prioritize future loss-reduction action plans.

In discussions with utility companies, the Team identified several specific interventions, all of which build upon the findings from this report, which can help international donors work with utility companies to undertake non-technical loss reduction initiatives.

**POTENTIAL PILOT PROJECTS FOR OPERATIONS AND INCENTIVE STUDY WORK**

- Given this report’s systematic analysis of the organizational aspects underlying effective incentive design, it would be useful to pilot the Team’s analytical framework and then implement an incentive pilot in line with those findings.
- Potential partners, based on indicated interest:
  - ESKOM (South Africa)
  - EdM (Mozambique)
  - Indian utilities (Jharkhand, Rajasthan or others focused on reducing AT&C losses)

**ACTIVITIES TO IMPLEMENT LESSONS LEARNED FROM THIS STUDY**

- **Facilitate knowledge exchange on HR incentive schemes:** This study identified a number of top-performing utilities in the area of non-technical loss reduction and related employee incentives. As discussed in the report, different approaches are used for different challenges and company contexts. It would be productive next step for individual representatives to meet as a group, discuss their incentive scheme efforts, and share lessons learned to promote knowledge-sharing and leadership. Such knowledge exchange could take place physically, online, or both.
- **Initiate technical assistance from top-performing utilities:** India has a broad range of utility companies across the maturity curve. There could be significant value in organizing a sample training session or knowledge-sharing workshop from one Indian utility to another on incentive structures and how those companies have used them in that country context. It may also be possible to invite non-Indian entities to such training, to promote South-South information exchange, to enable. These training session could target a:
  - Focus on utilities (such as Rajasthan) with high losses, limited technologies, and manual MBC processes.
  - Focus on utilities that have recently unbundled comparatively later than others (such as Jharkhand, Punjab or Tamil Nadu), who are in the process of setting up many of their operational processes and are soliciting input on how to structure their internal institutions.
APPENDIX A—METHODOLOGY AND QUESTIONNAIRE

METHODOLOGY

The Team used a holistic approach to select utilities most adept and able to provide qualitative and quantitative data on their loss-reduction programs. The Team evaluated more than 40 utilities based on the metrics described in the table below.

Figure 15: Down Selection Methodology Metrics

<table>
<thead>
<tr>
<th>#</th>
<th>Metric</th>
<th>Definition</th>
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<tbody>
<tr>
<td>1.</td>
<td>Average Electricity Loss Reduction (%)—Minimum Three-Year Period</td>
<td>• Electricity loss refers to the amounts of electricity injected into the transmission and distribution grids for which end users do not pay. Total losses have two components: technical and non-technical. Technical losses occur naturally and consist mainly of power dissipation in electricity components, such as transmission and distribution lines, transformers, and measurement systems. Non-technical losses are caused by actions external to the power system and consist primarily of electricity theft, nonpayment by customers, and errors in account and record-keeping. Electricity losses are typically expressed as a percentage of total electricity reported on an annual basis. This study will focus primarily on non-technical electricity loses. To obtain an average loss reduction over time, we will look at the amount of losses achieved divided by the number of years in that time period.</td>
</tr>
<tr>
<td>2.</td>
<td>Access to Electricity (%)</td>
<td>• Access to electricity in service area, expressed as the percentage of the population with access to electricity. Utilities will be scored based on the access to electricity, with lower access to electricity representing a higher score.</td>
</tr>
<tr>
<td>4.</td>
<td>Loss-Reduction Target</td>
<td>• Existence of loss-reduction targets within an identified utility.</td>
</tr>
<tr>
<td>5.</td>
<td>Employee/Community Engagement Programs</td>
<td>• Existence of an employee and/or community engagement program(s) within an identified utility. Programs should focus on engagement with employees and the community to drive loss-reduction program. This has been shown to be particularly important in slum communities.</td>
</tr>
<tr>
<td>6.</td>
<td>Regulatory Environment</td>
<td>• Regulatory environment where utility is operating, defined as the laws and regulations developed by federal, state, and local/provincial institutions to oversee the electricity industry. Examples include mandated goals for, or subsidies targeting loss reduction by, the province, state, government, municipality, or any other government/regulatory organization.</td>
</tr>
<tr>
<td>7.</td>
<td>Existence of Antitheft Laws and Adequate Judicial Systems</td>
<td>• The existence of antitheft laws and adequate judicial systems that would allow utilities to legally act on stolen electricity, a major component of non-technical electricity loss, and/or delinquent payments.</td>
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</table>
# | Metric | Definition |
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<tr>
<td>8.</td>
<td>Professional Relationship with Identified Utility</td>
<td>Deloitte’s connection to the utility through direct relationship with one or more of the Team’s team members. Either direct prior working experience or established connections within a utility.</td>
</tr>
<tr>
<td>9.</td>
<td>Industry Reputation</td>
<td>The reputation of the utility in the industry.</td>
</tr>
<tr>
<td>10.</td>
<td>USAID Awareness</td>
<td>USAID awareness is meant to identify utilities in question that have ties or connections with current or past USAID projects. A previous relationship would indicate that the utility is open and willing to work with USAID again.</td>
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</table>

**QUESTIONNAIRE**

The Team applied a down selecting methodology to score and rank a list of 43 utilities against each metric to arrive at 10 to 12 target utilities for the employee incentive study. From there, the team developed an outreach plan, distributed the questionnaire to each target utility, and conducted follow-up interviews, as needed.

*Figure 16: Interview Questionnaire*

<table>
<thead>
<tr>
<th>Respondent Information</th>
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<tbody>
<tr>
<td>Respondent Name (Optional):</td>
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<tr>
<td>Title:</td>
</tr>
<tr>
<td>Email:</td>
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<tr>
<td>Phone:</td>
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<tr>
<td>Electric Utility:</td>
</tr>
<tr>
<td>City:</td>
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<tr>
<td>State:</td>
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<tr>
<td>Country:</td>
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<td>Date of Response:</td>
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<table>
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<tr>
<th>Company Information</th>
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<tbody>
<tr>
<td>Does your electric utility have a group specifically focused on loss-reduction initiatives?</td>
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<tr>
<td>Has your electric utility established loss-reduction targets for the current time period (year, month, quarter, etc.)?</td>
</tr>
<tr>
<td>Does your electric utility have active employee or community engagement programs?</td>
</tr>
<tr>
<td>Would you say that non-technical electricity losses are a major problem for your electric utility?</td>
</tr>
<tr>
<td>What levels of commercial/non-technical losses has your electric utility experienced throughout the last three years?</td>
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**Company-Level Target Setting and Objectives**
1) What are your company's loss-reduction targets (non-technical/commercial), and how are those targets chosen?

2) How are these targets passed down to departmental level/group level?

3) What incentives exist at a departmental level/group level (please elaborate on the incentive scheme design and its application)?

4) How are these incentives linked to real outcomes (i.e., actual loss reduction)?

5) How do you ensure that targets are realistic and have employee buy-in while setting them?

6) How are grievances addressed if an employee feels that they have been unfairly compensated? Is there a grievance redressal mechanism?

7) How do loss-reduction targets flow from company-level goals to individual levels?

**Individual Incentive Scheme Structure**

1) Does your company have any kind of variable remuneration linked to performance targets (bonus structure)? What metrics are used, and how are those metrics weighted?

2) What is the incentive scheme at an individual level (please elaborate on the incentive scheme design and its application)?

3) How are these incentives linked to real outcomes (i.e., actual loss reduction)?

4) What payout mechanism is used, and how do payouts vary by employee level and function? If there is extra pay, how much is available? Is it fixed or variable?

5) Do incentives for loss reduction vary by region or location? If so, how are those differences determined?

6) Please describe social programs and other types of community engagement that are being done in low-income areas to incentivize loss reduction.
### Experience and Interventions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Does your company have working groups focused on improving current operational processes? Are commercial losses and electricity theft reduction processes part of the focus of these working groups? How are their studies shared within the company?</td>
</tr>
<tr>
<td>2)</td>
<td>Does your utility participate in any industry associations (regional or otherwise) that are focused on loss reduction? Does your company encourage visits to other companies to exchange experiences of solutions for commercial losses reduction plan? Do you think this encourages employees to seek new ideas or solutions to improve the performance of your commercial loss-reduction program?</td>
</tr>
<tr>
<td>3)</td>
<td>In your opinion, what encourages employees to engage in combatting non-technical/commercial losses? Why?</td>
</tr>
<tr>
<td>4)</td>
<td>What kind of incentive, financial or nonfinancial, do you think is most effective in motivating employees? Why?</td>
</tr>
<tr>
<td>5)</td>
<td>Has your electric utility undertaken any commercial loss-reduction initiatives that failed? How did you encourage and motivate your employees to implement such initiatives? Why did they fail?</td>
</tr>
<tr>
<td>6)</td>
<td>In your opinion what are the social or political pressures that keep your employees from combatting non-technical losses? How does your program address them? How could it address them better?</td>
</tr>
</tbody>
</table>

### Comments

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Do you have any questions or comments that you think would be relevant to this study?</td>
</tr>
</tbody>
</table>
APPENDIX B—EXAMPLE ACTIVITY-BASED INCENTIVE CALCULATIONS

Appendix B and C present detailed examples of utility incentive structures that utility companies surveyed as part of this report currently use. The specifics presented in these case studies illustrate the approach and basic mechanics that utility managers should take into account when they are designing their own incentive study structures.

These case study appendices follow a similar structure. Each appendix presents the basic information on the utility company, lays out the incentive structure equations and underlying formulas, and end with a summary on the unique components of the incentive methodology. In all of the examples, the methodology details are available to employees and the process for applying them is maintained in the company’s HR department.

Appendix B focuses on activity-based structures from Empresas Publicas Medellin (EPM) in Colombia and Ibrid District Electricity Company (IDECO) in Jordan. Appendix C focuses on variable pay incentive structures that two sets of Indian distribution utilities currently use.21

EMPRESAS PÚBLICOS DE MEDELLÍN (EPM) COMPANY

EPM is a vertically integrated utility company that is owned by the municipality of Medellin, Colombia, and serves more than 1.8 million industrial, commercial, and residential clients in the Medellin municipal area. EPM, like many other utility companies, outsources much of its field service, repair, and collections work to contractors. In order to improve quality and minimize corruption, EPM developed an incentive scheme to improve the performance of contracted companies.

METHODOLOGY

For its contracted field services work, EPM utilizes a variable remuneration table, which is set according to the success rate of the inspections individuals in the company undertake and their success rate in recovering electricity losses, as illustrated in the figures below.

21 The methodologies from several Indian utilities were published in a report by India’s Forum for Regulators, “Loss Reduction Strategies,” in September 2008. Some of these methodologies are also captured in a broader study by the Regulatory Economics Advisory unit at Price Waterhouse Coopers India Private Limited, “Study to evolve an appropriate model of incentive-disincentive mechanism for Distribution Utilities” published in 2010.
In the interview with the Team, EPM described its incentive structure as follows: “In the case of contracted operating personnel, an economic recognition [incentive] for the reporting of irregularities [fraud] associated with an effective energy recovery is established in the company’s specifications, which is paid 70 percent for the operating field crews and 30 percent to the contractor firm. This approach has been revised in order to motivate the contracted staff. There are now two moments of monetary recognition: the first a standard amount when the company is notified (to promote receiving the incentive quickly), and the second a variable amount by the energy actually recovered associated with the successes, and as it improves its effectiveness receive a greater bonus.”

**ANALYSIS**

EPM’s activity-based approach has several interesting features. First, the value of the incentive is adjusted for different client types. The impact of this are two-fold: it incentivizes the contracted staff to focus on the commercial and industrial (nonresidential) customers, due to the higher percentage payback for that category, and prioritizes recovery from EPM’s highest revenue customers. Second, the two-fold nature of the payment—at the identification of the loss and then weighted to for the actual amount recovered—is designed to encourage not only a large number of hits, but also follow through on collecting the payments. Finally, the manner in which the payments are distributed to the contracted company—a split between a transfer to the company itself and then direct payments to its staff—is designed to encourage proactive leadership along with an active field staff.

**IRBID DISTRICT ELECTRICITY COMPANY (IDECO)**

**COMPANY**
IDECO is one of three privately owned distribution companies in the Kingdom of Jordan, primarily serving the northern, rural areas of the country. It serves approximately 350,000 residential, commercial, and industrial customers, of which the water pumping facilities play a central role in electricity consumption.

IDECO has run incentive schemes for its employees to identify meter tampering for close to 15 years, which has required it to evolve the program over time to correct for misaligned incentives and improved results.

The Jordanian regulator, the Energy & Minerals Regulatory Commission, sets and approves the incentive methodology for the IDECO inspection and metering staff, according to the following methodology.

**METHODOLOGY**

**Article 1:** The following incentives are expended in connection to inspection services in addition to other allowances and incentives offered to inspectors, and shall be debited to total incentives and honorariums provided to company staff:

- Incentive of notification on meter abuse (1 or 3 phase meter direct) after case verification = 15 dinar
- Incentive of notification on meter abuse (3 phase meter with CT) after case verification = 100 dinar
- Incentive of notification on out-of-work meter or proven nonfunctional = 15 dinar
- Incentive for disconnecting a customer who committed subscriber’s meter abuse = 5 dinar
- Incentive for repairing the connection of the subscriber after meter abuse by IDECO technician other than inspectorates’ section staff = 5 dinar
- Incentive of capturing of CT meter abuse case by inspection crew team after case verification = (0.05) of total amount refunded from abuse cases (equal shares to team members)
- Incentive of inspection team van driver = 1.5 dinar for each abuse-verified case by the team

**Article 2:** Incentives of inspection-section supervising staff (section head, engineers, and administration assistants) are as follows:

1. Engineers’ incentives = 50% (of total allocated incentives for supervising staff to include section head, engineers, and administration assistants. The amount is distributed in accordance with the following performance indicators (PI):

<table>
<thead>
<tr>
<th>PI No.</th>
<th>PI of Engineers</th>
<th>PI Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of cases found by the unit reporting to the engineer. Payment condition:</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Number of found cases by the unit reporting to the engineer shall not be less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>than 18 multiplied be the number of crews in the unit reporting to that engineer, such PI incentive shall not be paid to the engineer.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Number of dealt with cases by the Inspector engineer, no matter which the</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>discoverer inspection team reports to.</td>
<td></td>
</tr>
</tbody>
</table>
The following formula applies:

**The Quarterly Incentive of the Inspector Engineer** = (quarterly allocation of the engineers’ incentives of PI 1) * (number of abuse cases found by the unit reporting to that engineer + total number of abuse (theft) cases found by the inspection section) + (quarterly allocation of the engineers’ incentives of PI 2) * (number of abuse cases dealt by inspector engineers) + (quarterly allocation of the engineers’ incentives of PI 3) * (total amounts collected by the engineer’s unit + total amounts collected by the inspection section whether in full or in installments.

1. Incentives allocation of administrative assistants = 25% of total incentive allocations for the supervising staff to include section head, engineers and administrative assistants. The amount is distributed in accordance with the following PIs:

<table>
<thead>
<tr>
<th>PI No.</th>
<th>PI of Engineers</th>
<th>PI Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of cases captured by the unit the admin belongs to.</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Payment condition:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of captured cases by the unit to which the admin belongs shall not be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>less than 18 multiplied by the number teams in the unit. Otherwise, such PI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>incentive shall not be paid to the clerk.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Total collected amounts by the inspection unit, which the clerk reports to</td>
<td>65%</td>
</tr>
<tr>
<td></td>
<td>whether such collected amounts are paid in full or in installments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**The Quarterly Incentive of the Inspection Admin Staff/Clerk** = (quarterly allocation of the clerks incentives of PI 1) * (number of abuse cases captured by the unit + total number of abuse cases found by the inspection section) + (quarterly allocation of the engineers’ incentives of PI 2) * (total amounts collected by the clerk’s unit + total amounts collected by the inspection section whether in full or in installments.

2. Incentives allocation of head of inspection section = 25% of total incentive allocations for the supervising staff to include section head, engineers, and administrative assistants.
**Article 3:** Incentives of the technical staff of the inspection section (inspection teams)

1. Incentives allocations of the technical staff of the inspection section shall be distributed to the inspection teams in accordance with the following performance indicators and their weights:

<table>
<thead>
<tr>
<th>PI No.</th>
<th>PI of Engineers</th>
<th>PI Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of cases found</td>
<td>65%</td>
</tr>
<tr>
<td>2</td>
<td>Number of charged abuse cases</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>Number of replaced nonworking meters</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

2. Quarterly Incentives allocations of the inspection teams for PI 1 = 65% of quarterly incentive allocations of the inspection teams. The amounts shall be distributed as follows:

- Inspection incentives of PI 1 shall be distributed using the progressive tiers scheme by increasing the weight of the case as number of captured cases increases according to the following table:

<table>
<thead>
<tr>
<th>Tier</th>
<th>Categories of Number of Cases Inspection Teams Found Quarterly</th>
<th>Abuse Case Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>0 to 18</td>
<td>0</td>
</tr>
<tr>
<td>2nd</td>
<td>19 to 27</td>
<td>1</td>
</tr>
<tr>
<td>3rd</td>
<td>28 to 35</td>
<td>1.5</td>
</tr>
<tr>
<td>4th</td>
<td>36 to 44</td>
<td>2</td>
</tr>
<tr>
<td>5th</td>
<td>45 to 53</td>
<td>2.5</td>
</tr>
<tr>
<td>6th</td>
<td>54 to 62</td>
<td>3</td>
</tr>
<tr>
<td>7th</td>
<td>63 or more</td>
<td>3.5</td>
</tr>
</tbody>
</table>

- Calculation of number of points per each inspection team shall be based on the following formula:

\[
\text{Number of points of inspection team for PI 1} = (\text{number of cases found by the team within the 1st tier} \times 0) + (\text{number of cases found by the team within the 2nd tier} \times 1) + (\text{number of cases found by the team within the 3rd tier} \times 1.5) + (\text{number of cases found by the team within the 4th tier} \times 2) + (\text{number of cases found by the team within the 5th tier} \times 2.5) + (\text{number of cases found by the team within the 6th tier} \times 3) + (\text{number of cases found by the team within the 7th tier} \times 3.5)
\]
• Calculation of each inspection team quarterly incentive of PI 1 shall be based on the following formula:

\[
\text{Quarterly inspection team incentive for PI 1} = (\text{quarterly incentives allocations of inspection teams of PI 1}) \times (\text{number of points of the inspection team} \div \text{total number of points of all teams})
\]

• In the event that an inspection team fails to find the minimum number of the set abuse cases quarterly (18 set cases), a punishment is addressed in accordance with the work regulations because of not meeting the minimum threshold of required productivity.

3. Quarterly inspection team incentive allocations of PI 2 = 15\% of quarterly inspection team's incentives allocations. The amount shall be distributed according to the following formula:

\[
\text{Quarterly inspection team incentive for PI 2} = (\text{Quarterly incentives allocations of inspection teams of PI 2}) \times (\text{number of accounted abuse cases} \div \text{total number of accounted abuse cases of all inspection teams})
\]

4. Quarterly inspection team incentive allocations of PI 3 = 20\% of net quarterly inspection team’s incentives allocations. The amount shall be distributed according to the following formula:

\[
\text{Quarterly inspection team incentive for PI 3} = (\text{Quarterly incentives allocations of inspection teams of PI 3}) \times (\text{number of cases of meters replacement by the team} \div \text{total number of meters replacement by all inspection teams})
\]

• Gross quarterly inspection team incentive = Total incentives of inspection teams of all three performance indicators (1, 2, and 3)

• If the inspection team consists of two technicians, the quarterly inspection team incentive is divided as follows:
  Inspection team leader’s share = 60\% of quarterly inspection team incentive
  Inspection team leader assistant’s share = 40\% of quarterly inspection team incentive

**Article 4**: Incentives stated in article (1) above shall be expended on a monthly basis after the end of every month. Whereas incentives stated in Articles 2 and 3 above are expended on a quarterly basis after the end of every quarter.

These regulations are valid starting January 1, 2015 and shall substitute any previous regulations or instructions relating to these incentives, which become void.

**ANALYSIS**

IDECO’s activity-based incentive structure includes several components to note. First, the incentive structure is based on a team approach, which aligns inspection units and galvanizes the whole group
toward results. The incentive structure is quite detailed, in fact, about how the funds should be allocated from inspection engineers through to the van drivers and administrative assistants, which can help solidify the team as a unit. Second, similar to EPM, the incentive is structured so that teams are incentivized to both record the tampering incident, but also follow through to the revenue recovery, so that they can receive the full value of the incentive. Finally, very differently from EPM, IDECO noted in its interview with the Team, that it does not utilize incentive structures with contractors, but rather only with staff, because they have had experiences where contractors are more likely to take advantage of an incentive structure, while employees are galvanized by both the incentive and the company impact.
APPENDIX C—EXAMPLE VARIABLE INCENTIVE CALCULATIONS (INDIAN DISCOMS)

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED (MSEDCL)

COMPANY

MSEDCL is a government-owned distribution company that provides power to 22 million residential, agricultural, commercial, and industrial customers in Maharashtra, India (apart from Mumbai, the state’s capital). It has consistently battled commercial losses and collection inefficiencies since its incorporation in 2005, and, due to focused programming, has slowly decreased the level of non-technical losses and load-shedding in its service territory.

METHODOLOGY

As part of this loss reduction approach, MSEDCL adopted a basic employee/staff incentive scheme in 2006, which has continued to evolve over time. Key highlights of the utility’s employee incentive scheme are provided below.

- A 10-point action plan for loss reduction, including a distribution infrastructure work plan, distribution system loss reduction, and collection efficiency improvement. An employee incentive scheme is employed to drive the action plan.

- Division-level incentives to reward improvements in aggregate technical and commercial efficiency (ATCE): ATCE is the ratio of realization per unit of energy input (RUEI) to the system to the average billing rate (ABR) for a specified period. The computation of the ATCE is at the division level and through transparent data on cash collected, energy input, total revenue billed, and quantity of energy the division itself billed.

The incentive amount payable to the division is 10 percent of the incremental revenue facilitated by operational efficiency beyond the threshold specified by leadership for the respective divisions. The maximum incentive that a division can claim is capped at sum of one basic salary of all the employees in the respective division at end of the quarter.

The sample computation MSEDCL utilized follows:

ATCE of a division in Q1 of year 1 is 75 percent; ATCE of the same division in Q1 of year 2 is 82 percent

Threshold to trigger the incentive mechanism (THIm) is set at a 2 percent increase in ATCE

One month’s basic salary of all employees in the division is 30 lakhs, equal to 3M Indian Rupees (Rs)

Cash collected (CC) in Q1 of year 2 is 35 crore (1 crore = 100 lakhs =10M Rs)

Then the incentive payable (IP) is

\[
IP = \{10\% \times [(ATCE_i - ATCE_{i-1}) - THIm] \times CC \}
\]

\[
= \{10\% \times [(82\% - 75\%) - 2\%) \times 35 \} \text{ crore} 
\]

\[
= 0.175 \text{ crore} = 17.5 \text{ lakhs}
\]

Total incentive payable is less than 30 lakhs, therefore the incentive payable is 17.5 lakhs

An employee with Rs10,000 as a basic salary shall receive Rs(17.5/30)* 10,000, i.e., 5,833 Rs as incentive for the quarter.
Recovery from employees for nonperformance on ATCE (disincentives): Recovery from employees up to 15 percent of the sum of one month’s basic salary is also followed in the utility in the event of drop in performance over a quarter as compared to the same quarter of the previous year. In line with the formula for incentive paid, the recovery is computed as follows:

\[ DR = 10\% \times [(ATCE_i - ATCE_{i-1}) - THD_m] \times CC \]

The formula above is further illustrated in the example below:

ATCE of a division in Q1 of year 1 is 85 percent; ATCE of the same division in Q1 of year 2 is 80 percent
Threshold to trigger the disincentive mechanism (THDm) is set at a 2.75 percent decrease in ATCE
One month’s basic salary of all employees in the division is 30 lakhs, equal to 3M Indian Rupees (Rs)
Cash collected (CC) in Q1 of year 2 is 35 crore (1 crore = 100 lakhs = 10M Rs)

Therefore, the disincentive to be recovered (DR) would be:

\[ DR = 10\% \times [(80\% - 85\%) - 2.75\%] \times 35 \text{ crore} \]
\[ = (0.271 \text{ crore}) = (27.1 \text{ lakhs}) \]

There is a total cap on the amount of the disincentive. The cap on the total disincentive to be recovered from a division was set at 15% of Rs. 30 Lakhs, which is Rs. 4.5 Lakhs. Since the disincentive to be recovered (as discussed in this example) is Rs. 27.1 lakhs (which is higher than the overall cap), only Rs. 4.5 lakhs would be recovered from the division.

The disincentive would be recovered by way of withholding of salaries from the employees in that division. The disincentive to be recovered from an employee with Rs 10,000 as a basic salary would be Rs (4.5/30)* 10,000, i.e., Rs. 1,500 for the quarter.

The scheme covers all staff in the operations and maintenance divisions and the base parameters for evaluation include ABR, RUEI, and the derived ATCEs for each division:
The evaluation and pay out of incentive/disincentive is quarterly and the program results are reviewed annually. Company leadership also reviews and modifies the thresholds for various measures annually.

ANALYSIS

MSEDCL’s incentive structure has several interesting components. First, the variable pay aspects of the structure create both an incentive and a penalty for operations and maintenance staff to deliver on the improvements on ATCE, based on baseline salary. This institutes the achievements, or lack of achievements, related to ATCE as a more central component of their daily tasks, rather than a stretch that employees are aiming for in addition to their guaranteed salaries. Second, this structure underscores the amount of high-quality data that the company needs to have available for the assessments, given that the methodology is built on billing and collections information. This highlights the level of maturity that a company might need to have to implement this level of incentive structure. Third, this variable pay program, even though it has an impact on individual salaries, is generated at the division level. This means that the staff within these divisions are very much incentivized to push their teams and their colleagues, since their personal income is dependent on the group outcomes.
MADHYA PRADESH DISCOMS

COMPANY

Madhya Pradesh, India has three utilities managing the distribution of electricity for specific geographic jurisdictions within that state. Two of these distribution companies, the Central and East DISCOMs in Madhya Pradesh, have established variable pay incentive schemes. The state owns these distribution companies, which serve around 4 million customers each in primarily rural areas. The key highlights of the utility’s employee incentive scheme for loss reduction is provided below.

METHODOLOGY\textsuperscript{22}

- **Division, circle, region and corporate-level group incentive scheme for loss-reduction and revenue collection**: Reduction of losses and achievement of revenue collection—as measured by the “minimum revenue per unit” (RPU)—are the key focus areas of the division and the incentives for the division offices are based on parameters related to achieved minimum RPU targets. The administrative offices (i.e., circle, region, and corporate offices) are rewarded on achievement of the loss reduction target as a whole or if more than 50 percent of the total number of subordinate offices achieve their loss-reduction target.

- **Loss-reduction targets established are based on division demographics and the division’s performance from previous years**: Three categories of divisions exist with the utility companies for the incentive structure. The classification and the targets for incentive payout on loss reduction and RPU are as follows:
  - Category A (city-based divisions)—Incentivized for loss reduction by 15 percent and increase in RPU by 55 to 65 paisa\textsuperscript{23} as compared to the previous year.
  - Category B (semi-urban divisions)—Incentivized for loss reduction of 10 percent and increase in RPU by 40 to 50 paisa as compared to the previous year.
  - Category C (rural divisions)—Incentivized for loss reduction of 5 percent and increase in RPU by 30 to 40 paisa as compared to the previous year.

- **Payout is split half-yearly and annual and ranges between 1.5 months of basic pay to 4 months of basic pay**: The performance parameters that divisions must achieve, and its subsequent payment to the employees and officers within that division, are defined as follows:

\textsuperscript{22} Central and East Madhya Pradesh DISCOMs implemented the incentive schemes from 2007 to 2008 as part of larger reform process. The detailed inputs on the scheme were provided by a sector expert in India, on contract with Deloitte India Consulting LLP since 2011, who was involved in the design and pilot roll-out of the scheme.

\textsuperscript{23} 1 paisa = 1/100 of an Indian rupee
**Performance Parameter** | **Incentive Payment**
--- | ---
a) On achieving minimum RPU | 1.5 month’s basic pay
b) On achieving 5% increase in minimum RPU | 2 month’s basic pay
c) On achieving 10% increase in minimum RPU | 2.5 month’s basic pay
d) On achieving 15% increase in minimum RPU | 3 month’s basic pay
e) On achieving 20% (or more) increase in minimum RPU | 4 month’s basic pay

The officers and employees in the administrative office are entitled to a sum linked to their basic salary upon achievement of the above targets either if the group meets the target or if 50 percent of the total number of subordinate offices meet their target. In the case of the latter, the amount payable to the officers and employees is the weighted average of the incentive payable to the performing subordinate offices.

A sample computation of payout is shown in the figure in the following page in Figure 18.

**ANALYSIS**

The MP distribution companies showcase several interesting facets of variable-based incentive structures. First, the incentive is tied directly to the salary of the individual, making the loss-reduction and revenue recovery much more central to the individual’s daily responsibilities. Second, as was the case with MSEDCL, the payment to the individual is based on the achievements of a larger business unit, making team dynamics and achievements across colleagues much more important for individual compensation. Third, the incentive payouts are structured based on the perceived difficulty of meeting the targets in that geographic area, so it could potentially encourage units to focus in places where the payout is the highest.
| S. NO | NAME OF DIVISION | Category of Divisions | Input Units (in Lakh) | Collection (in Rs. Cr.) | Loss % | Target Loss Reduction % | RPU | Min. FPU for EMPLOYEE INCENTIVE SCHEME | Targeted Revenue Collection in FY 2007-08 (in Rs. Cr.) | Average Payment against Increase in FPU if base and collection exceed FPU | RPU % on 8% Increase in Min. FPU | Revenue collection on 8% Increase in Min. FPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | RPU % on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU | Revenue collection on 8% Increase in Min. RPU |
|-------|------------------|----------------------|----------------------|----------------------|-------|------------------------|-----|---------------------------------------|-----------------------------------------------|------------------------------------------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1     | Bhopal City Circle | 35.37              | 2.08                | 3.03                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |
| 2     | Bhopal Damm Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 3     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 4     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 5     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 6     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 7     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 8     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 9     | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 10    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 11    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 12    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 13    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 14    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 15    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 16    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 17    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 18    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |
| 19    | Godavari Dam Circle | 28.58              | 1.59                | 1.67                 |       |                        |     |                                       |                                                               |                                                             |                       |                                |                                |                                |                       |                                |                                |                                |                                |                                |                                |                                |                                |                                |                                |