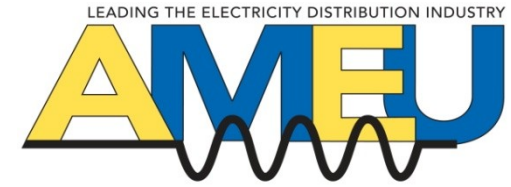


PARSONS BRINCKERHOFF



NON TECHNICAL LOSSES - HOW DO OTHER COUNTRIES TACKLE THE PROBLEM?

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**AMEU CONVENTION
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BACKGROUND

- Technical losses in a distribution network are well understood and their reduction is finite and essentially an engineering issue.
- Non technical losses, on the other hand, although also well understood have evolved into an art form and their reduction requires innovation and persistence. Utilities around the world are actively addressing the issues.

WHAT DO NTL's COST?

- It has been said that theft and non-payment of electricity are equivalent to the output of one Eskom "Six Pack" power station.
- The term "Viva the Meter" would appear a common "Terms of Reference" for urban based "Meter Consultants".

DEFINITIONS

- **Technical Loss:** The component of distribution network losses that is inherent in the physical delivery of electric energy. It includes conductor loss, transformer core loss, and potential/current coils in metering equipment.
- **Non-technical losses:** Includes the electric energy lost due to pilferage, tampering of meters, and erroneous meter reading and/or billing.

HOW DO THE LEVELS VARY?

- The level of non-technical losses varies generally according to the economic conditions of the country.
- In countries where GDP per capita is very low it is common to find higher levels of non-technical losses - perhaps because the cost of electricity is high relative to household income?
- Philippines, Indonesia and Thailand are the exception - most likely due to the fact that poor customers receive subsidized electricity

COUNTRIES OF INTEREST

Country	Estimated NTL's in 2007	PPP per capita 2007
India	20% to 40%	2,700
Philippines	3.5%	3,300
Indonesia	5.5%	3,400
Jordan	3% to 5%	4,700
Jamaica	13.2%	4,800
China	10%	5,300
Thailand	0.32%	8,000
Brazil	0.5% to 25%	9,370
Turkey	6% to 64%	9,400
South Africa	~ 10%	10,600
Venezuela	12.74%	12,800
Russia	10%+	14,600
UK, Aus, US	0.2% to 1%	> 30,000

Meralco - Philippines

- In 1986, all-time high total loss level of 21%.
- System loss caps were introduced in 2003 at 15% and reduced to 9.5% in the following year and remained at 9.5% to present day
- NTL's in 2007 estimated at 3.5%
- Support from the Law
- Organisation - appointed a Senior Executive to head their Revenue Protection Department.
- Performance scorecard measure has twice the weighting of any other performance target – financial, customer, process or people-related.

PLN - Indonesia

- Level of theft is not as high as might be
- An affordable social tariff that meets needs of the poor
- Ensure that customers can meet the tariff obligations.
- The greatest problem is theft in the large user segment
- In 2003 launched operation in the industrial areas over two months.
 - Charged 235 customers
 - A further 287 companies were raided



Jamaica Public Service Company

Throw-Ups	5.2%
Other theft	0.8%
Defective equipment	3.0%
Incorrect installations	0.3%
Improper account set up	0.2%
TOTAL	9.5%

- Tried a “carrot and stick” strategy – no effect
- Following privatisation in 2002 removed 30,000 illegal connections
- Master meters installed at the entrance of “garrison” communities

JPSC Cont'd

- Tightening of internal controls
- Gentle persuasion
- Audit of large accounts
- Meter ordering and supply process was improved
- Persistence & Prosecution
- Multi-sector, multi-prong approach canvassing support from the regulator, civic society, the political directorate, Commerce Chamber and the media
- In 2007 34 arrests, audited 15,000 accounts, removed 25,000 throw-ups
- Introduced an AMI program for commercial customers.



Electricity de Caracas, Venezuela

- EDC acquired by AES in 2000
- Half the population in the metropolitan area of Caracas live in barrios
- 18% NTL's in 2004 to 12.74% in 2007
- In 2003 launched the Barrio Eléctrico (Electric Shantytown) to turn illegal consumers of electricity into customers.
- Employees in lower levels had family or knew people in the barrios and understood life in those places
- Improved billing and collection procedures
- recruited a team of 20 social workers

EDC (cont)

- Installation and consolidation of electricity roundtables (Mesas Electricas)
- Improvement of the public lighting system
- Installation and maintenance of pre-paid meters
- Installation and maintenance of collective meters
- Creation and consolidation of electrical cooperatives (Coopeléctricas)
- Establishment of authorized community commercial agents
- Training of community leaders: leadership courses

INDIA

- Non-technical losses of Indian State Electricity Boards are estimated to be as high as 40% - 50%.
- 40 percent of homes in poor neighbourhoods have illegal power connections, but the supply is unreliable and costs twice as much as a legal connection.
- In 2000 government amended the Indian Electricity Act made electricity theft a cognizable offence and imposed stringent penalties.
- Separate law provided for mandatory imprisonment and penalties for offenders, allowed constitution of special courts and tribunals for speedy trial, and recognized collusion by utility staff as a criminal offence

INDIA (cont)

- A minimum mandatory punishment of 3 to 60 months imprisonment for the theft of electricity
- Mandatory financial penalties ranging from a minimum of US\$120 to a maximum of US\$1, 200
- Residents convicted of stealing electricity would be prohibited from receiving electricity for two years
- The establishment of special courts and tribunals to quickly try cases under the new law
- Billings for electricity increased by 34 percent and revenues increase by 44 percent
- NTL's 38% in 1999 and reduced to around 26% by 2003

TURKEY

REGIONS	NTL %	Customers 2007 (m)
DQCLE EDAL.	64,7%	0,97
VANGÖLÜ EDAL.	56,2%	0,39
ARAS EDAL.	29,4%	0,70
ÇORUH EDAL	12,0%	0,97
FIRAT EDAL	11,0%	0,65
TOROSLAR EDAL	9,8%	2,51
BASKENT EDAL	8,7%	2,95
AKDENQZ EDAL	9,3%	1,40
GEDQZ EDAL	8,6%	2,29
BO`AZQÇQ EDAL	12,5%	3,72
Average for all 20 Regions	14,8%	

TURKEY (Cont)

- Initiatives to improve situation commenced in 1996 but attempts to “privatise” have stalled repeatedly for legal and political reasons.
- NTL’s due to all of the “conventional” reasons, including untidy low voltage networks, unsupportive legal systems, meter tampering, poor billing systems
- Also a lack of institutional strength and poor management of the state owned utilities
- Privatization of distribution companies will use a Transfer of Operating Rights (“TOR”) backed by a Share Sale model (“TSS model”)
- The investor will be the sole owner of the shares of the distribution company and will be the unique licensee for the distribution of electricity

SUMMARY OF METHODS

- Choose methods appropriate for specific culture
- Measurement
- Regulatory incentives
- Privatisation – financial incentives
- Resource allocation – management incentives
- Large user inspections & off-cycle meter audits
- Community involvement and programs

SUMMARY OF METHODS (cont)



- High loss circuits
- Billing exceptions - vigilance
- Anonymous reporting
- Pre-payment metering
- Communal metering
- Support of the Law - fines and imprisonment

Thank you