

1. [Home](#)
2. [Information Systems and Management Science](#)
3. Conference paper

Technical Losses (TI) and Non-technical Losses (NTL) in Nigeria

- Conference paper
- First Online: 05 September 2021
- pp 147–159
- [Cite this conference paper](#)

Information Systems and Management Science(ISMS 2020)

- [Adeyemo Ayokunle](#),
- [Sanjay Misra](#),
- [Jonathan Oluranti](#) &
- [Ravin Ahuja](#)

Part of the book series: [Lecture Notes in Networks and Systems](#) ((LNNS, volume 303))

Included in the following conference series:

- [International Conference on Information Systems and Management Science](#)
- 281 Accesses

Abstract

Generation of power by power stations passes through the complex and large network. Many types of equipment are used in the process of transmitting to the end-users, such as transformer, overhead lines, cables, and other equipment. It has been observed that the amount of power generated by Generating Companies (GENCO) compared to the amount of power reaching the Distribution Companies (DISCO) and neither does it matches the amount reaching the customers. This paper reviews all forms of Technical and Non-Technical losses and also lay emphasis on the accurate estimation on the amount of both losses recorded over the past years and how to reduce both Technical and Non-technical losses in Nigeria.

This is a preview of subscription content, [log in via an institution](#) to check access.

Similar content being viewed by others

Electricity Pilferage: A Review on Electrical System Losses and the Trend of Its Reduction in the Indian Perspective

Chapter © 2022

Research on Theoretical Line Loss Calculation Analysis and Loss Reduction Measures of Main Network Based on Multiple Factors

Chapter © 2020

Impact of Introducing Small Scale Distributed Generation on Technical Losses in a Secondary Distribution Network

Chapter © 2017

References

-
1. Parmar, J.: Total losses in power distribution and transmission lines (2013). Accessed 19 Aug 2021. <https://electrical-engineering-portal.com/total-losses-in-power-distribution-and-transmission-lines-1>
 2. Ekwue, A.O.: On the correctness of load loss factor. Niger. J. Technol. **34**(3), 546–547 (2015)

[Article Google Scholar](#)

3. Smith, T.B.: Electricity theft: a comparative analysis. *Energy Policy* **32**(18), 2067–2076 (2004)

[Article Google Scholar](#)

4. Aguero, J.R.: Improving the efficiency of power distribution systems through technical and non- losses reduction. In: IEEE PES Transmission Distribution Conference Exposition, pp. 1–8 (2012)

[Google Scholar](#)

5. Davidson, I.E.: Evaluation and effective management of non-technical losses in electrical power networks. In: IEEE AFRICON, 6th Africon Conference Africa, pp. 473–477, June 2002

[Google Scholar](#)

6. Nagi, J., Mohammad, A., et al.: Non-technical loss analysis for detection of electricity theft using support vector machines. In: IEEE International Conference Power Energy, PECon 2008, pp. 907–912 (2008)

[Google Scholar](#)

7. Nagi, J., Mohammad, A.M., et al.: Non-technical loss detection for metered consumers in power utility using support vector machines. *IEEE Trans. Power Deliv.* **25**(2), 1162–1171 (2010)

[Article Google Scholar](#)

8. Monedero, I., et al.: Detection of frauds and other non-technical losses in a power utility using Pearson coefficient, Bayesian networks and decision trees. *Int. J. Electr. Power Energy Syst.* **34**(1), 90–98 (2012)

[Article Google Scholar](#)

9. Mwaura, F.M.: Adopting electricity prepayment billing system to reduce non-technical energy losses in Uganda: lesson from Rwanda. *Util. Policy* **23**, 72–79 (2012)

[Article Google Scholar](#)

10. Ramos, C.C.O., et al.: A novel algorithm for feature selection using harmony search and its application for non-technical losses detection. *Comput. Electr. Eng.* **37**(6), 886–894 (2011)

[Article Google Scholar](#)

11. Viegas, J.L., et al.: Solutions for detection of non-technical losses in the electricity grid: a review. *Renew. Sustain. Energy Rev.* **80**, 1256–1268 (2017)

[Article Google Scholar](#)

12. Aguero, J.R.: Improving the efficiency of power distribution systems through technical and non-technical losses reduction. In: *Proceedings of the IEEE PES transmission and distribution conference and exposition* (2012)

[Google Scholar](#)

13. Lewis, F.B.: Costly throw-ups: electricity theft and power disruptions. *Electr. J.* **28**(7), 118–135 (2015)

[Article Google Scholar](#)

14. Sahoo, S., et al.: Electricity theft detection using smart meter data. In: *2015 IEEE Power Energy Society Innovative Smart Grid Technologies Conference*, pp. 1–5 (2015)

[Google Scholar](#)

15. Gonen, T.: *Electric Power Distribution System Engineering*. McGraw- Hill Inc. (1986)

[Google Scholar](#)

16. Mam, M., Leena, G., Saxena, N.S.: Distribution network reconfiguration for power loss minimization using bacterial foraging optimization algorithm. *Int. J. Eng. Manuf.* **6**(2), 18–32 (2016)

[Google Scholar](#)

17. Suriyamongkol, D.: Non-technical losses in electrical power system. MSc thesis, Ohio University, November 2002

[Google Scholar](#)

18. Dick, A.J.: Theft of electricity—how UK electricity companies detect and deter. In *European Convention on Security and Detection*, pp. 90–95, Brighton, U.K, 16–18 May 1995

[Google Scholar](#)

19. Nizar, A.H., et al.: A data mining based NTL analysis method. In: Proceedings of the 2007 IEEE Power Engineering Society General Meeting, No. 3, pp. 1–8 (2007)

[Google Scholar](#)

20. Antmann, P.: Reducing technical and non-technical losses in the power sector background paper for the World Bank group energy sector strategy. Technical reports (2009)

[Google Scholar](#)

21. Fourie, J.W, Calmeyer, J.E.: A statistical method to minimize electrical energy losses in a local electricity distribution network. In: Proceedings of the 7th IEEE AFRICON Conference Africa: Technology Innovation, Gaborone, Botswana September 2004

[Google Scholar](#)

22. Adesanya, A., Misra, S., Maskeliunas, R., Damasevicius, R.: Prospects of ocean-based renewable energy for West Africa's sustainable energy future. Smart Sustain. Built Environ. **10**(1), 37–50 (2020)

[Article Google Scholar](#)

23. Ayodele, E., Misra, S., Damasevicius, R., Maskeliunas, R.: Hybrid microgrid for microfinance institutions in rural areas—a field demonstration in West Africa. Sustain. Energy Technol. Assess. **35**, 89–97 (2019)

[Google Scholar](#)

24. Ogunleye, O., Alabi, A., Misra, S., Adewumi, A., Ahuja, R., Damasevicius, R.: Comparative study of the electrical energy consumption and cost for a residential building on fully AC loads vis-a-vis one on fully DC loads. In: Jain, V., Chaudhary, G., Taplamacioglu, M.C., Agarwal, M.S. (eds.) Advances in Data Sciences, Security and Applications. LNEE, vol. 612, pp. 395–405. Springer, Singapore (2020). https://doi.org/10.1007/978-981-15-0372-6_32

[Chapter Google Scholar](#)

25. Aderemi, O., Misra, S., Ahuja, R.: Energy consumption forecast using demographic data approach with Canaanland as case study. In: Bhattacharyya, P., Sastry, H.G., Marriboyina, V., Sharma, R. (eds.) Smart and Innovative Trends in Next Generation Computing Technologies, pp. 641–652. Springer Singapore, Singapore (2018). https://doi.org/10.1007/978-981-10-8657-1_49

[Chapter Google Scholar](#)

26. Adeyemi-Kayode, T.M., Misra, S., Damaševičius, R.: Impact analysis of renewable energy based generation in West Africa—a case study of Nigeria. PROBLEMY EKOROZWOJU–Probl. Sustain. Dev. **16**(1), 67–78 (2021)

[Google Scholar](#)

[Download references](#)

Acknowledgment

The authors appreciate the sponsorship from Covenant University through its Centre for Research, Innovation and Discovery, Covenant University, Ota Nigeria.

Author information

Authors and Affiliations

- Center of ICT/ICE Research, Covenant University, Canaanland, Nigeria**
Adeyemo Ayokunle, Sanjay Misra & Jonathan Oluranti
- Shri Viswakarama Skill University, Gurgaon, India**
Ravin Ahuja

Corresponding author

Correspondence to [Sanjay Misra](#).

Editor information

Editors and Affiliations

- CIS Dept, University of Malta, Msida, Malta**
Lalit Garg

2. **Department of Computer Science, Central University of Rajasthan, Rajasthan, India**
Nishtha Kesswani
3. **CIS Dept, University of Malta, Msida, Malta**
Joseph G. Vella
4. **Faculty of ICT, University of Malta, Msida, Malta**
Peter A. Xuereb
5. **The Education University of Hong Kong, Hong Kong, Hong Kong**
Man Fung Lo
6. **Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines**
Rowell Diaz
7. **Computer Engg, CUCRID Bldg, #A301, Covenant University, Ota, Nigeria**
Sanjay Misra
8. **Lm Thapar School of Management, Thapar University, Mohali, India**
Vipul Gupta
9. **Manipal University Jaipur, Jaipur, India**
Princy Randhawa

Rights and permissions

[Reprints and permissions](#)

Copyright information

© 2022 The Author(s), under exclusive license to Springer Nature Switzerland AG

About this paper

Cite this paper

Ayokunle, A., Misra, S., Oluranti, J., Ahuja, R. (2022). Technical Losses (TI) and Non-technical Losses (NTL) in Nigeria. In: Garg, L., *et al.* Information Systems and Management Science. ISMS 2020. Lecture Notes in Networks and Systems, vol 303. Springer, Cham. https://doi.org/10.1007/978-3-030-86223-7_14

Download citation

- [.RIS](#)

- [.ENW](#)
- [.BIB](#)
- DOI https://doi.org/10.1007/978-3-030-86223-7_14
- Published 05 September 2021
- Publisher Name Springer, Cham
- Print ISBN 978-3-030-86222-0
- Online ISBN 978-3-030-86223-7
- eBook Packages [Intelligent Technologies and Robotics](#) [Intelligent Technologies and Robotics \(R0\)](#)

Publish with us

[Policies and ethics](#)

Access this chapter

[Log in via an institution](#)

Chapter

EUR 29.95

Price includes VAT (Nigeria)

- Available as PDF
- Read on any device
- Instant download
- Own it forever

Buy Chapter

eBook

EUR 117.69

Softcover Book

EUR 149.99

Tax calculation will be finalised at checkout

Purchases are for personal use only

[Institutional subscriptions](#)

- Sections
- References

-

- [Apress](#)

165.73.223.224

Covenant University Ota (3006481499)

© 2024 Springer Nature