



---

The 2019 General Meeting and PIESA-IERE South Africa Forum  
October 28-31, 2019

## **Development a System Dynamic Model for Utilities Revenue Evaluation under Distributed Energy Resources**

**Desmond Ighravwe, Daniel Mashao**  
**University of Johannesburg**  
**South Africa**

### **Keywords:**

### **Abstract**

The proliferation of distributed energy resources (DER) has started causing a change in a utility firm's revenue. As the households' standard of living improves, utility firm revenue will continue to reduce. Hence, this article used a system dynamics (SD) modelling approach to evaluate the impact of DER on utility firm revenue. During the modelling of this problem, energy generation, cost of energy, number of DER and number of households were considered. These parameters were considered as techno-economic and social parameters that affect a utility firm's revenue. The developed SD model performance was evaluated using VENSIM software. Results from the model showed that the difference between the actual and perceived revenues declined constantly before a steady increase. At the end of 2050, the utility firm revenue will reduce by 6%. The proposed model has the capacity to be used to simulate different scenarios for a utility firm's revenue.