

## AI-Driven Strategies for Sustainable Electronics Repair: A Case Study in Energy Efficiency

**Authors :** Badiy Elmabrouk, Abdelhamid Boujarif, Zhiguo Zeng, Stephane Borrel, Robert Heidsieck

**Abstract :** In an era where sustainability is paramount, this paper introduces a machine learning-driven testing protocol to accurately predict diode failures, merging reliability engineering with failure physics to enhance repair operations efficiency. Our approach refines the burn-in process, significantly curtailing its duration, which not only conserves energy but also elevates productivity and mitigates component wear. A case study from GE HealthCare's repair center vividly demonstrates the method's effectiveness, recording a high prediction of diode failures and a substantial decrease in energy consumption that translates to an annual reduction of 6.5 Tons of CO2 emissions. This advancement sets a benchmark for environmentally conscious practices in the electronics repair sector.

**Keywords :** maintenance, burn-in, failure physics, reliability testing

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