ALTERNATIVE INVESTMENT STRATEGIES FOR IMPROVING DISTRIBUTION SYSTEM RELIABILITY BY USING REPRESENTATIVE NETWORKS

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Introduction

• The regulation of distribution network monopolies has been shifted from asset-based to Performance based
• The enormous diversity in real distribution systems has been a major obstacle for strategic planning activities
• In order to simplify the planning decision-making processes, a Representative Networks (RNs) model has been implemented
Objectives

• Strategic assessment of reliability performance of distribution networks

• Evaluation of benefits of alternative investment strategies to improve reliability performance

• Quantifying cost - benefit assessment with alternative investment strategies
Methodology 1/2

- Disaggregation
- Construction of representative networks
- Reliability evaluation
Methodology 2/2

- Investment Scenario Strategies
  - upgrading cables
  - refurbishing/undergrounding OH Lines
  - improving the efficiency of fault response teams
  - increasing the number of switching devices/circuit breakers
  - introducing automation
  - introducing remote control
  - reconfiguration possibilities by means of back-fed facilities
Case Study & Results 1/2

- This methodology has been tested on six UK DNOs networks
- Case study consists of 30 feeders with total 19,349 connected customers
- The feeders are with different structural and population parameters

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• The investments scenario of adding one fault breaking device into each RN and the real feeder are performed

• The analysis of real feeders is done by GROND software

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Conclusions

• The modelling of various high-level network investment strategies on RNs have been implemented

• The obtained benefits evaluated with RN concept have considerable accuracy which is proven by the analyses on real feeders

• Future work is finish the implementation of costing
Thank You