

# 2015 Annual Conference

November 25<sup>th</sup>, 2015

## ETH RRE – Reliability and Risk Engineering Laboratory

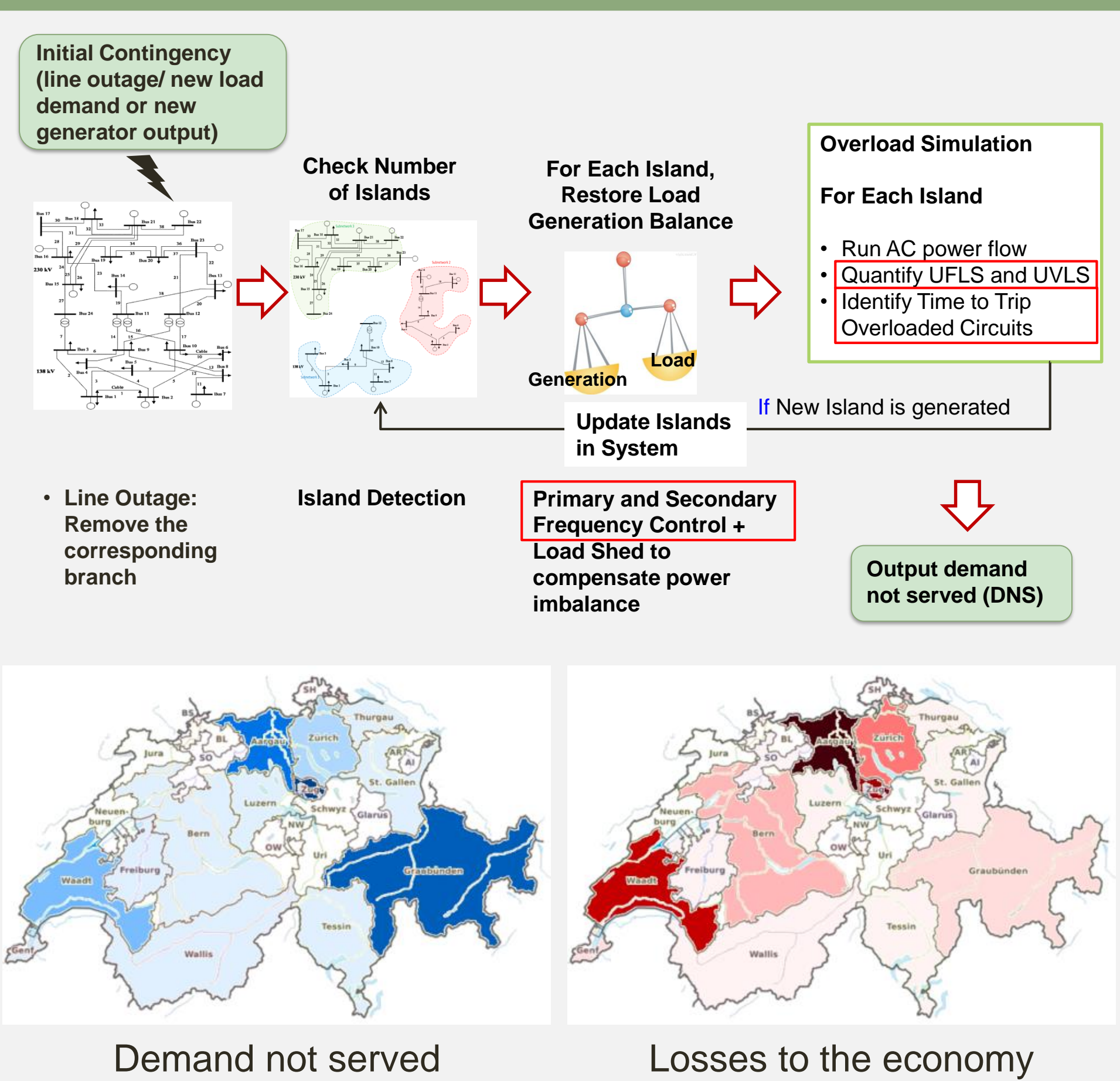
Prof. Dr. Giovanni Sansavini

Dr. Yi-Ping Fang, Andrea Antenucci, Li Bing, Alexander David, Di-An Tian

Research in the Laboratory of Reliability and Risk Engineering is aimed at the development of innovative techniques and hybrid analytical and computational tools suitable for analyzing and simulating failure behavior of engineered complex systems.

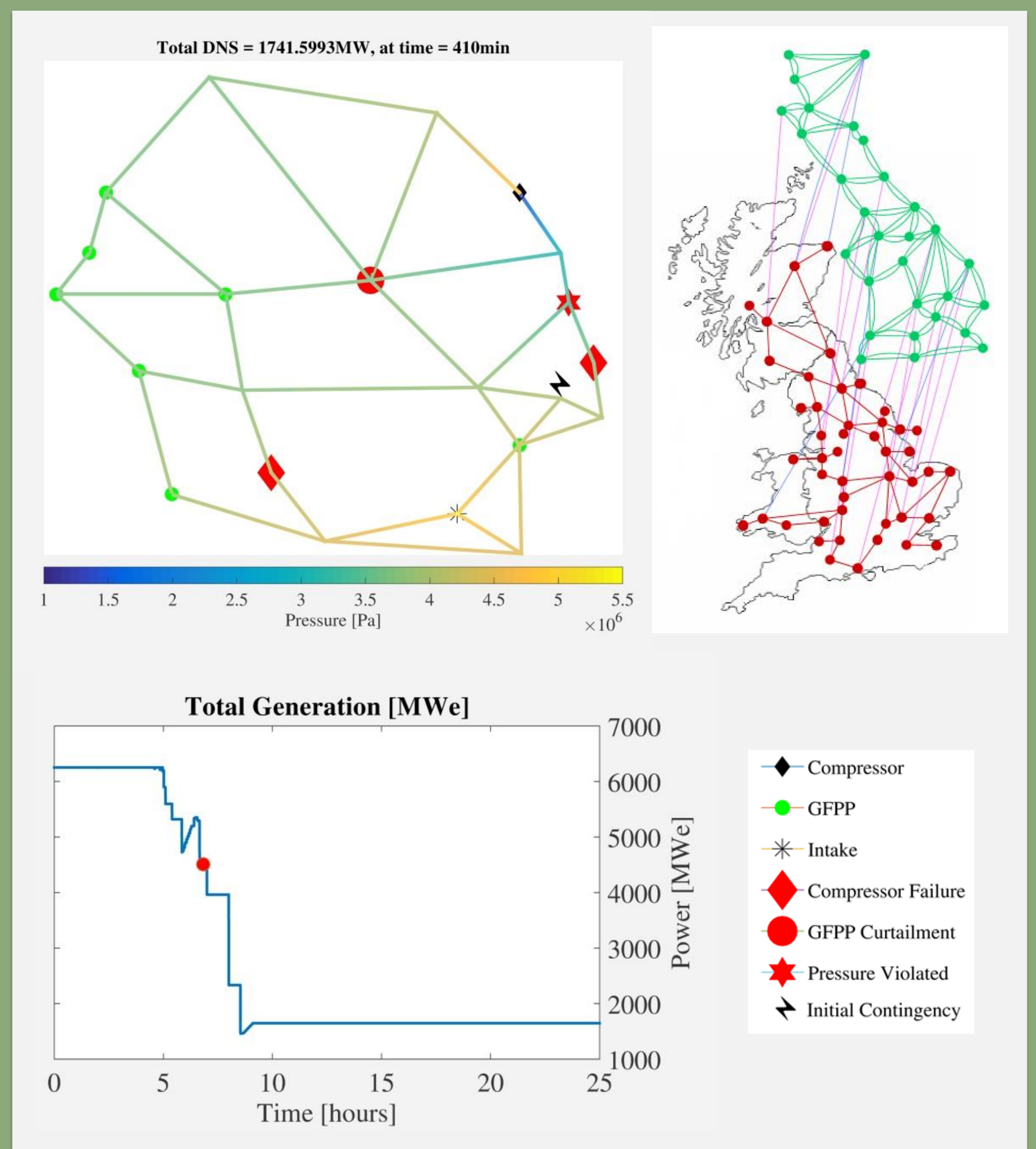
### 1.1 Cascading Failures in Power Grids

AC power flow with models of automations and protections



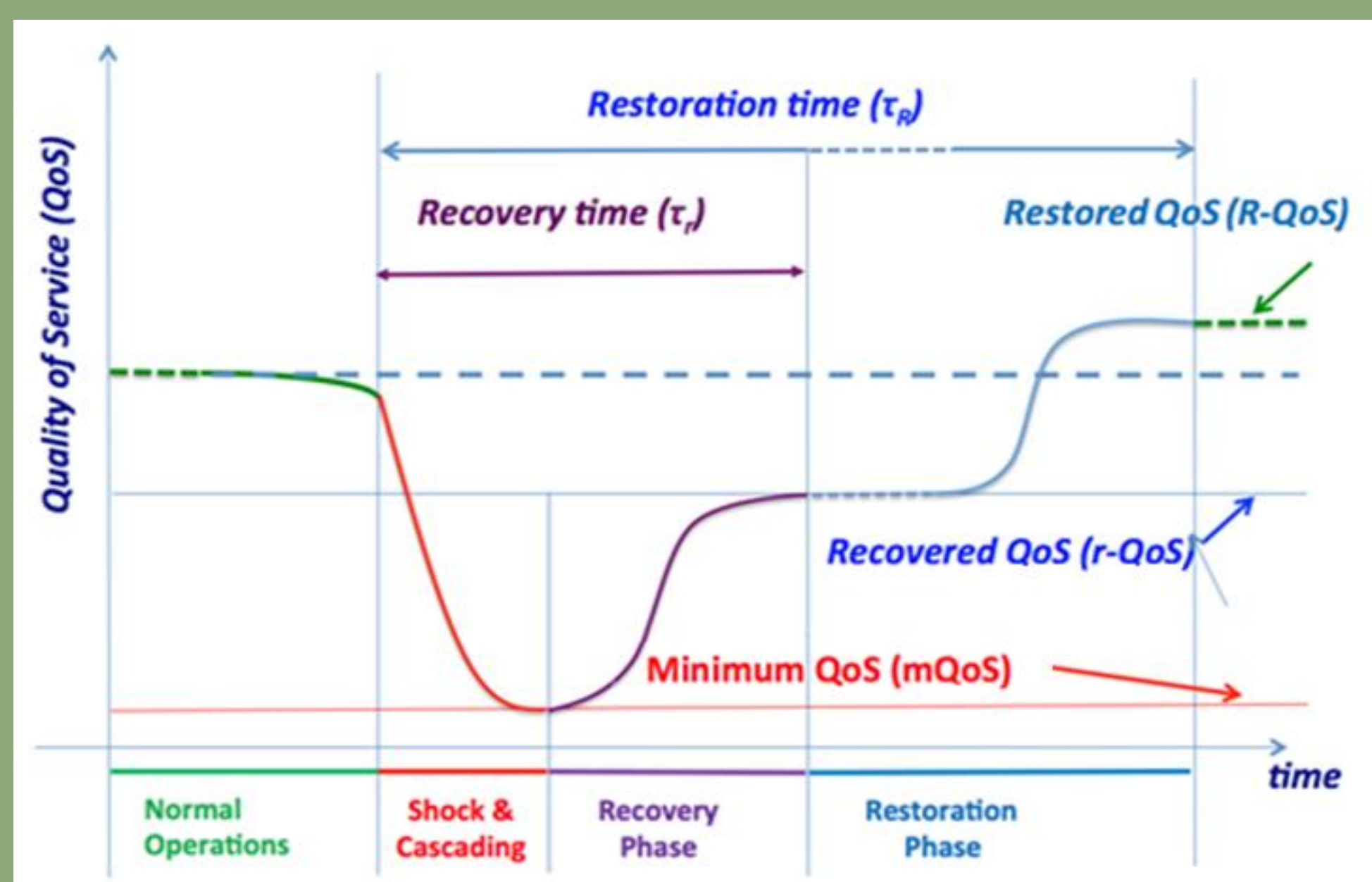
### 1.2 Interdependent Power and Gas Networks

Component failures or stressful operation in a gas network such as a sudden power generation drop due to RES can induce operational constraint violations, e.g. pressure violations, and lead to instabilities not only in the gas network.



## 2 Resilience of Infrastructures

The change caused by a perturbation can be embraced by reducing the shock and cascade phase or by improving the recovery and restoration phase.



## 3 Optimal Restoration of Infrastructures

