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ENERGY AND CLUSTER MANAGEMENT GROUP,
ELECTRICAL ENERGY LABORATORY; DEPARTMENT OF ELECTRICAL ENERGY, METALS, MECHANICAL CONSTRUCTIONS AND SYSTEMS
Brecht ZWAENEPOEL, Joannes I. LAVEYNE, Greet VAN EETVELDE, Lieven VANDEVELDE

COMBINING INDUSTRIAL BACKUP GENERATORS TO PROVIDE STRATEGIC RESERVE TO THE GRID

Introduction

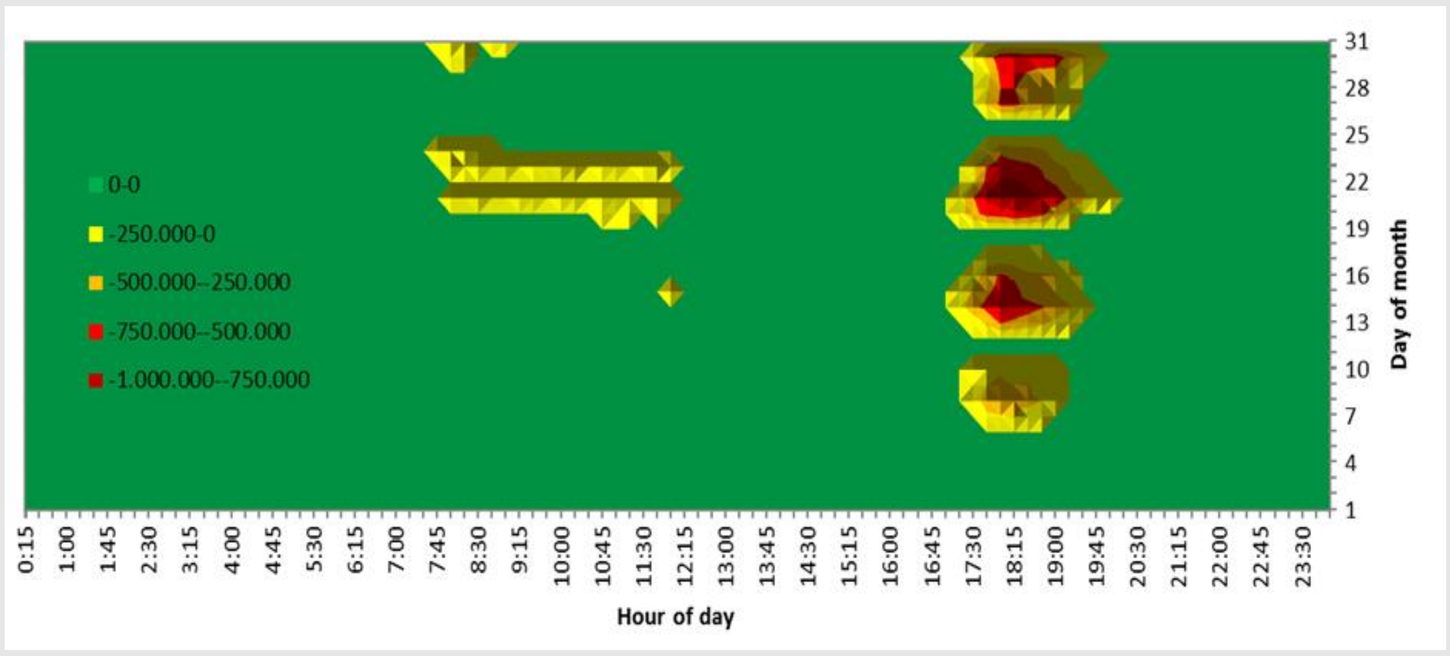
Reduction of conventional generation

Nuclear power reduction
– Uncertain nuclear phase-out
– Frequent (temporarily) shutdowns

Closing fossil (gas) power plants
– Decreasing spark spread
– Long lead time

Existing backup generators
– Few running hours
– High maintenance cost

– Grid paralleling possible
– Expensive conformity check



Problem:

Power shortage during winter peak consumption
– Cold, dark, no wind
– Limited interconnection capacity
– Up to 1GW in Belgium (peak power 14GW)

Peak power capacity required
– Mainly between 17-19h during winter
– Expensive – few running hours
– Limited candidates available

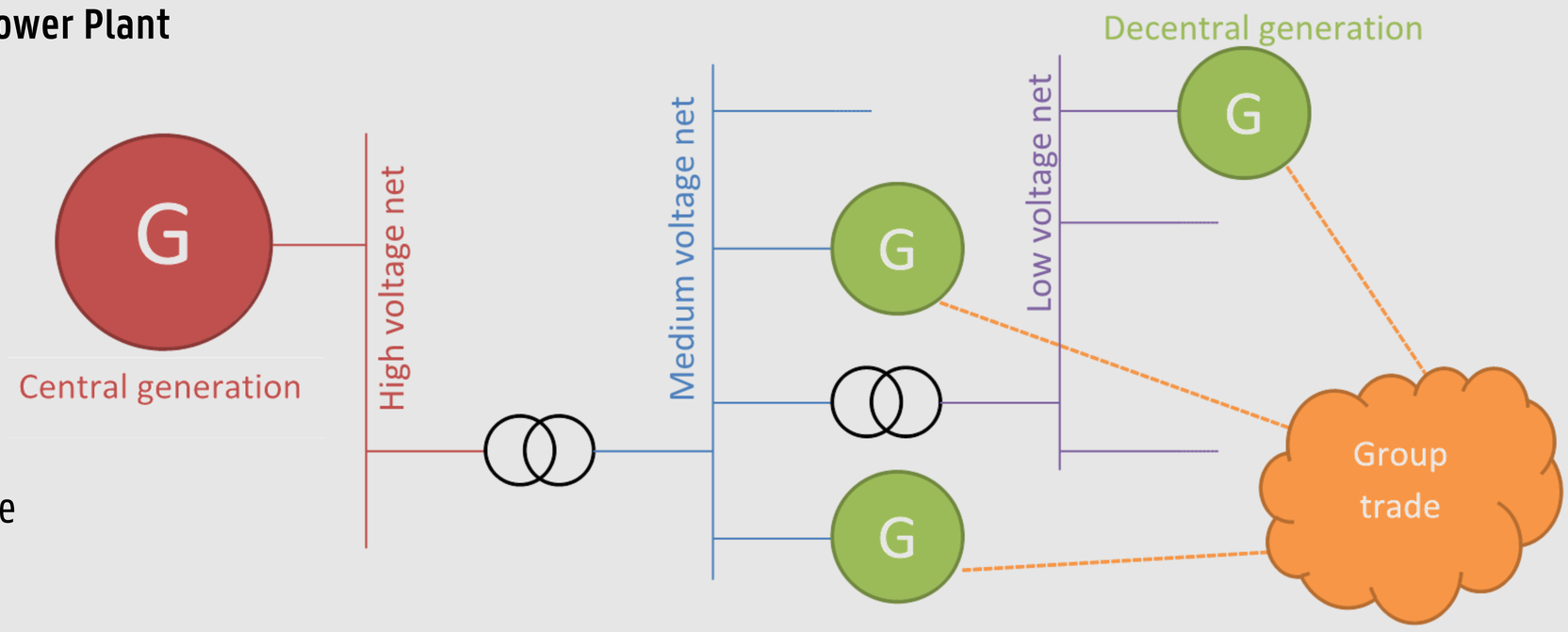
Problem evolution
– First time: winter 2014-15
– Strategic reserve rarely activated as of 2016-17

Proposed solution

Combine backup generators in Virtual Power Plant
– Central control by TSO or aggregator

Advantages
– Existing infrastructure
– Remuneration for backup generators
– Regular load testing
– Close older power plants

Disadvantages
– Increased maintenance due to higher use
– Local exhaust - pollution
– Impact (congestion) on distribution grid



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Contact

Brecht.zwaenepoel@ugent.be
www.ugent.be/ea/eemmecs/en

Universiteit Gent
@ugent
Ghent University

GHENT UNIVERSITY