



# Innovations in system operations up to 2030

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Supported by:



Federal Ministry  
for Economic Affairs  
and Climate Action

on the basis of a decision  
by the German Bundestag

# InnoSys 2030 - Innovations in system operations up to 2030



- Project time: October 2018 - December 2021
- Head of consortium: TenneT TSO GmbH
- Funded by the German Ministry for Economic Affairs and Climate Action with 9.375 Mio. EUR

Supported by:



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## Research objective

Higher grid utilization by system wide coordinated use of

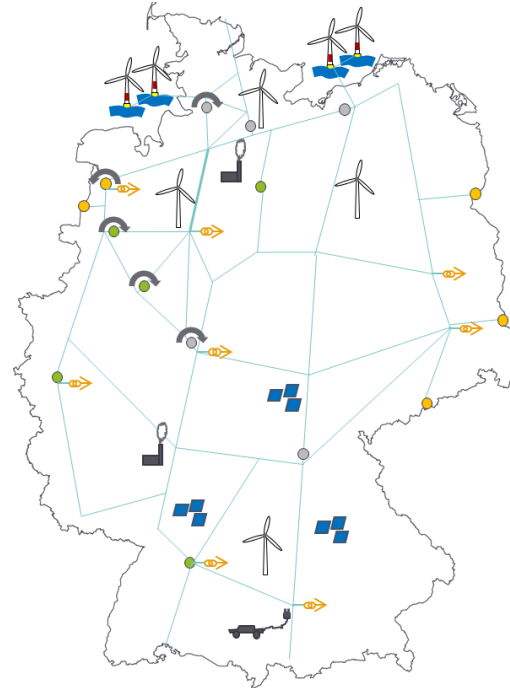
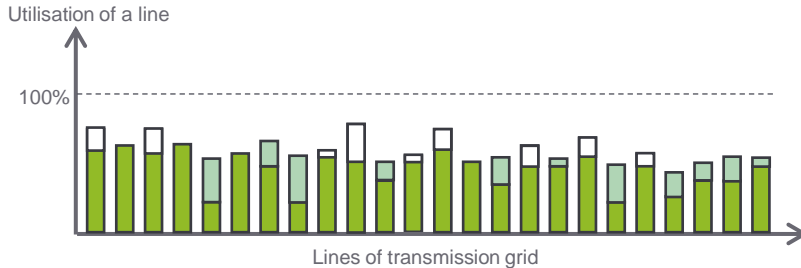
- horizontal load-flow control
- curative remedial actions and a
- higher degree of system automation

while not endangering the level of **system security**

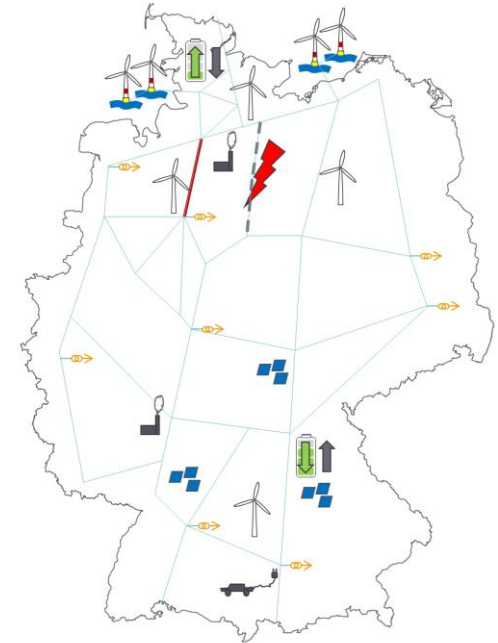
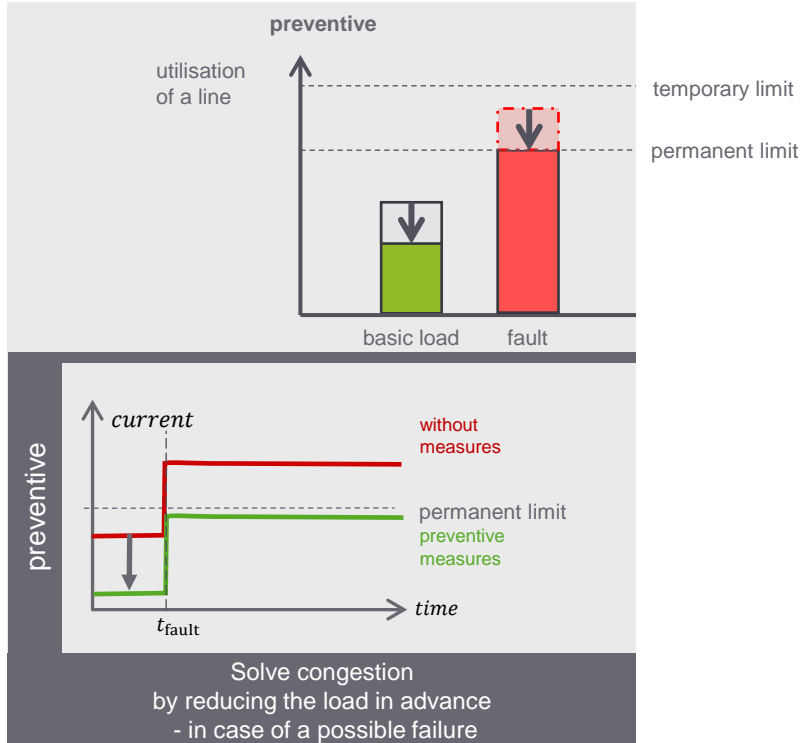
# Mechanism of action – horizontal load-flow control

Load flow controlling assets

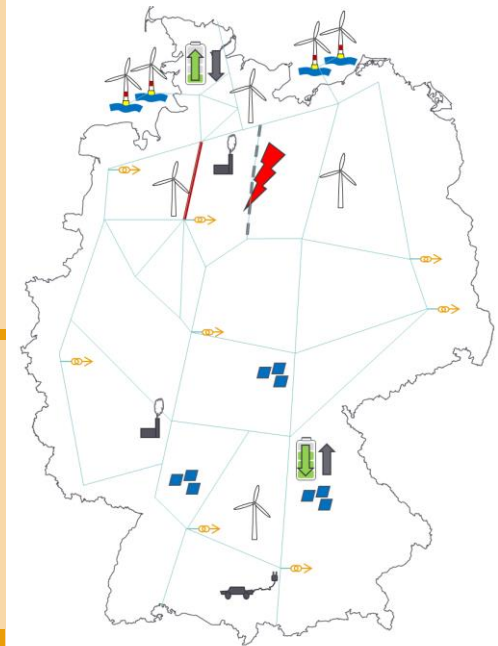
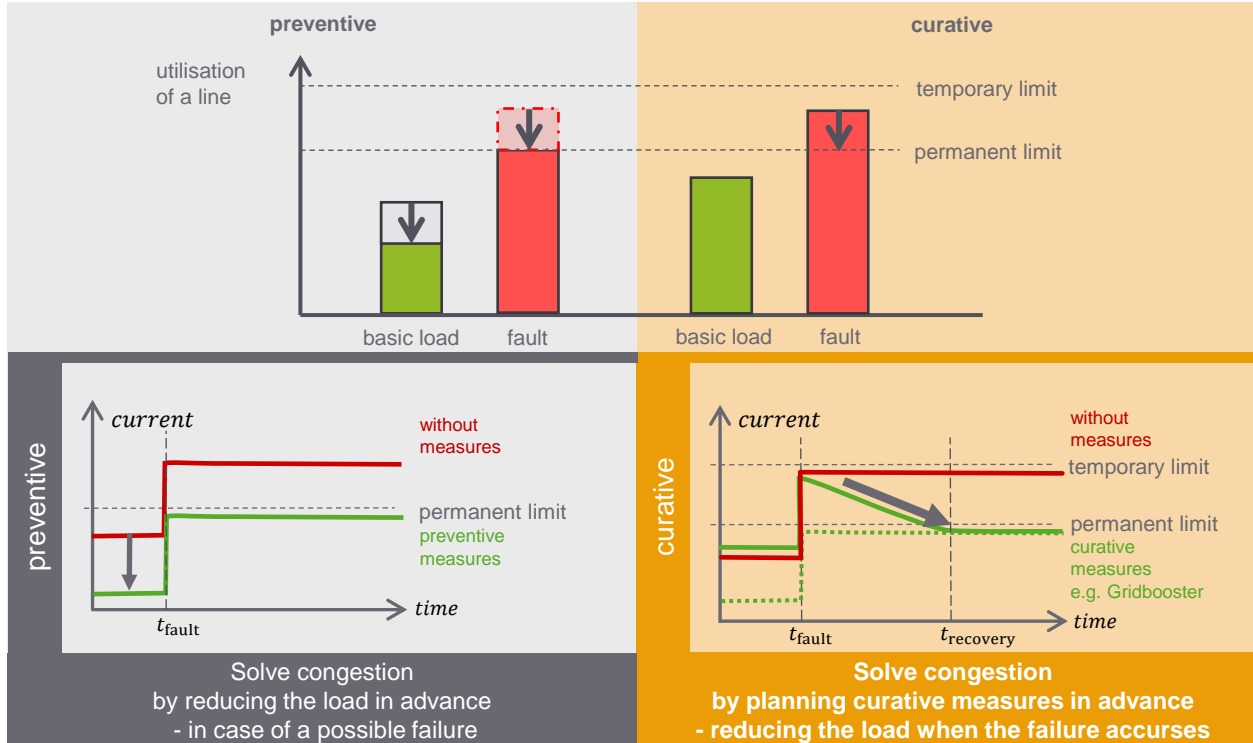
- Phase-Shifting Transformer (PST)
- Series Capacitors (TCSC)
- HVDC (not in picture)
- Balancing the load flow in the grid



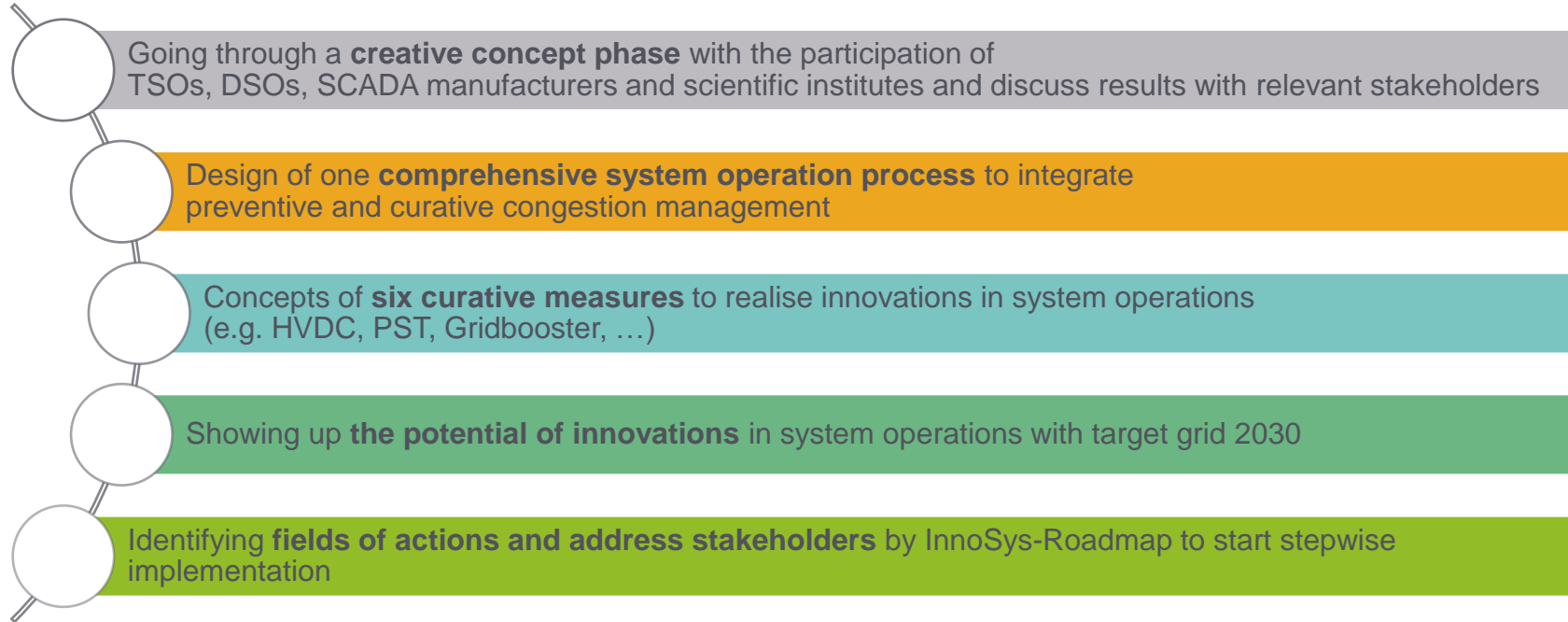
# Mechanism of action – preventive und curative



# Mechanism of action – preventive und curative



## Achievements of InnoSys 2030



# InnoSys-Roadmap – stepwise approach till 2030



# InnoSys 2030



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