Global perspective on grid resilience

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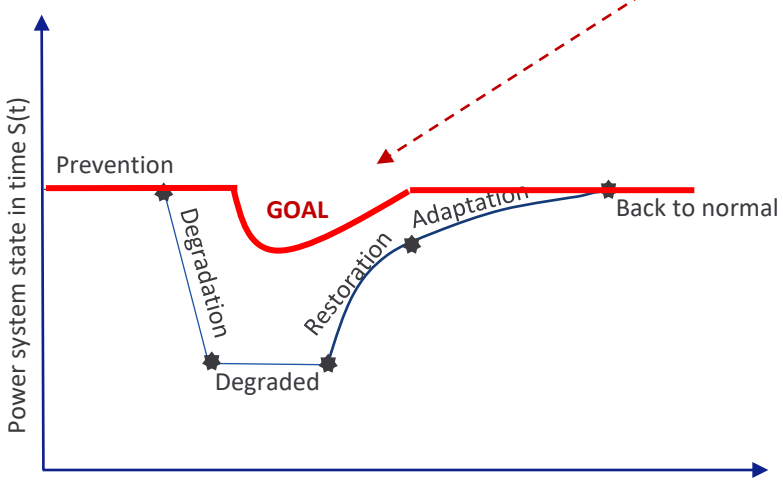
entsoe
Reliable Sustainable Connected

Why focus on grid resilience today … more than ever?



„Mismatch“ is growing!

Digitalization

Cloud

Flexibility

IT security

Open systems

One System

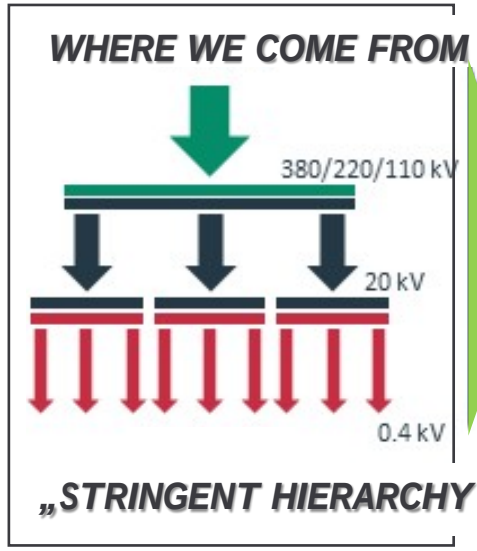
Full transparency of everything

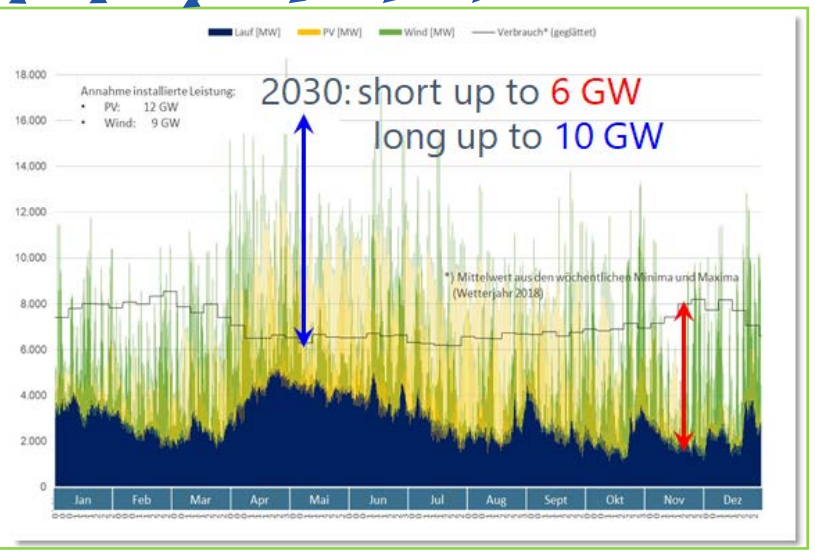
(Missing) standards

Cyber threat

AI decision support systems

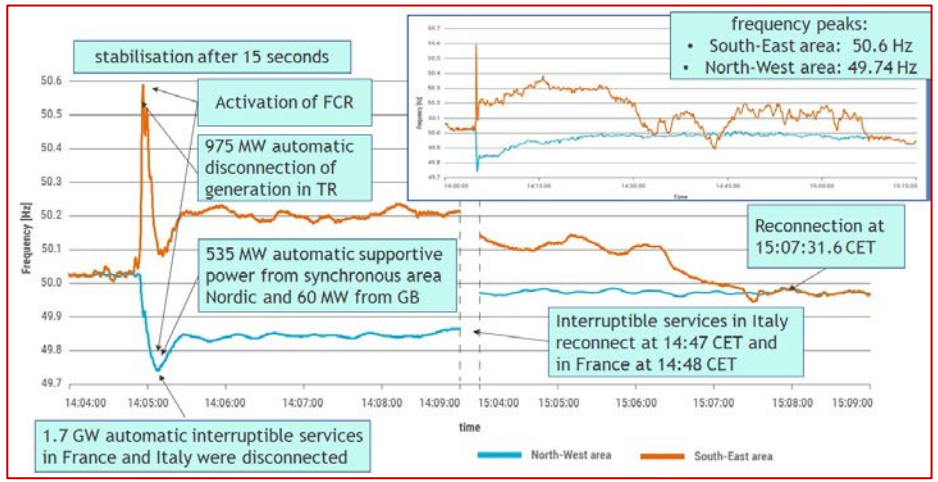
DDOS & more viral ones …





From the practice …

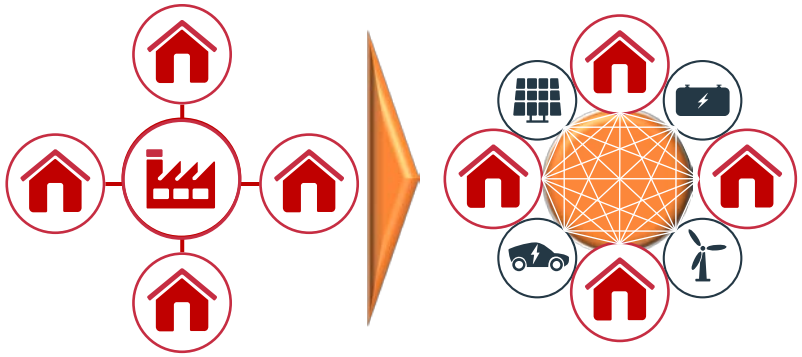
- Even the best prevention cannot fully exclude incidents like e.g. the one of 8th January 2021
- Resilience means that people & system are capable of fast and successful restoration
- 8th January 2021 incident shows hence a highly resilient system with **fast recovery within ~1 hour**



- But this is electric power "only", what about digital dimension and cyber security ?

… for the future

- **Digitalization:** growing number of small and micro units connected to all voltage levels of TSO and DSO grids yields an "Internet of electric power things"

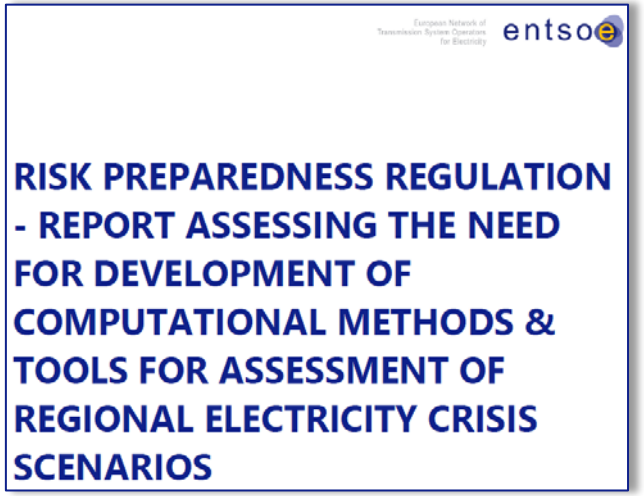


- **Risks:** failing control systems, corrupted data, manipulation to provoke P/f incidents, unexpected behavior of smart systems, unpredictable reaction during incidents because of complexity
- **Mitigation:** standards & regulation like Cybersecurity NC, new recovery skills, methods and tools, novel training & simulation approaches building on situation-driven roles, holistic view on power & cyber incidents

The real work has started …

- Excellent cooperation of DSOs and TSOs during informal and in future formal development of Cybersecurity NC
- Risk preparedness (following legislation) as fundamental discipline for resilience ➔ to be published soon

cf. Article 5 of Risk Preparedness Regulation (EU) 2019/941 / Methodology for Identifying Regional Electricity Crisis Scenarios, approved by ACER Decision 07/2020 of 6th March 2020



Scenarios

1. Extreme natural hazards
2. Technical contingencies
3. Malicious actions
4. Fuel shortage

Others (violation of N-1 criterion, industrial or nuclear accidents, loop flows, forecast errors, unforeseen effect of market rules, …)

… and it will be delivering successfully!

Thank you for your attention!

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