



IEC 61850

Update of TC57 WG activities

*Digital substation. Standard IEC 61850.
Digitalization of electrical power grid*

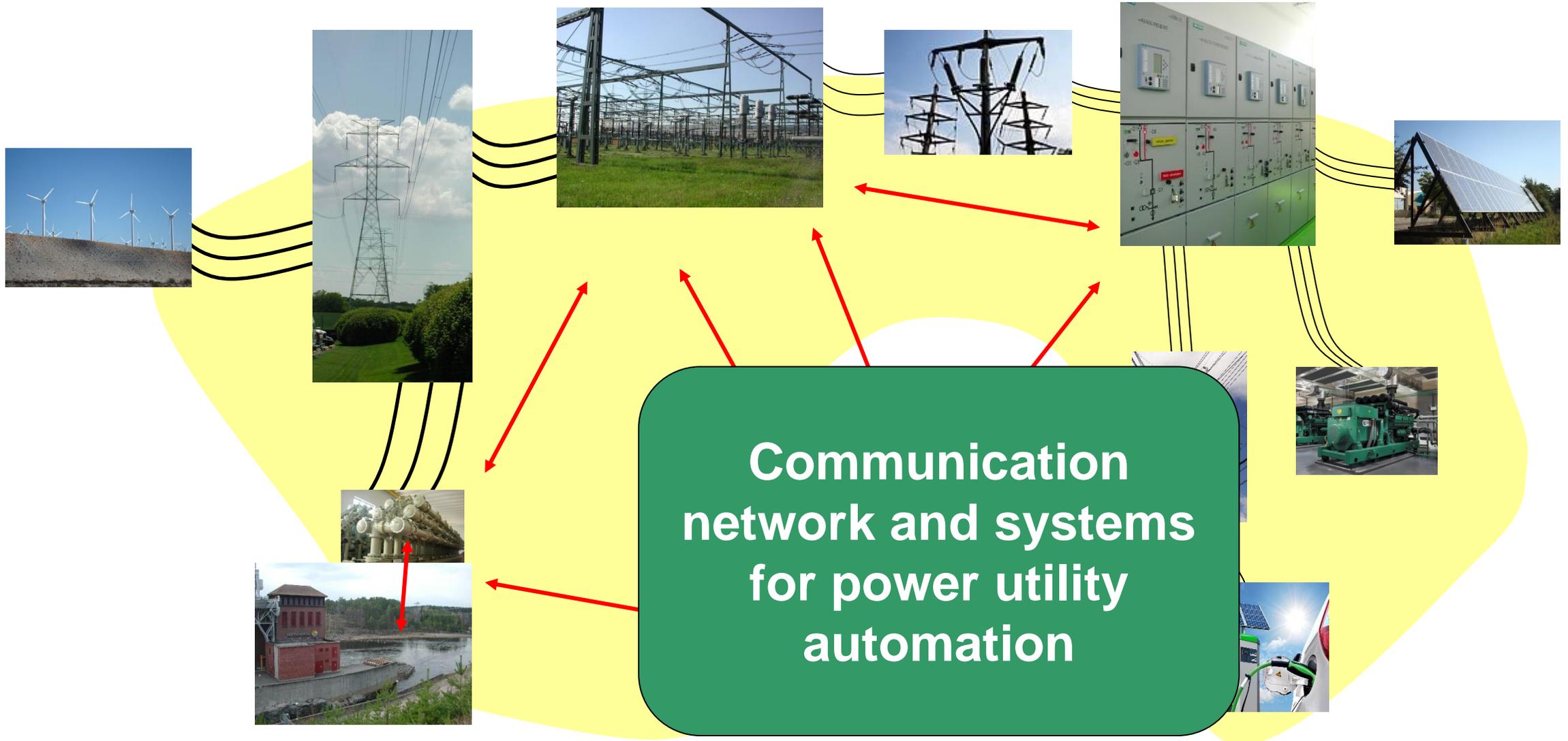
Moscow, July 2 – 4, 2019

Christoph Brunner
Switzerland

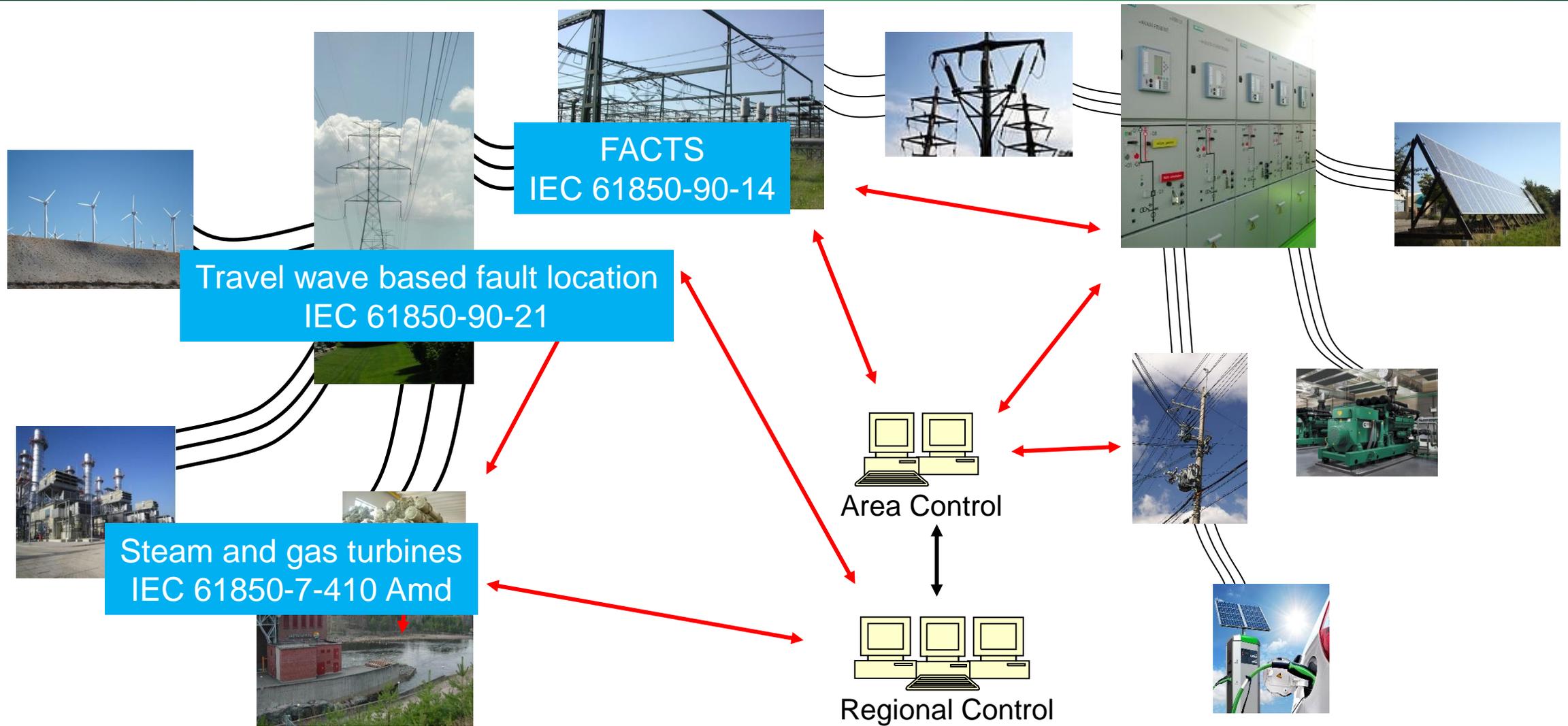
Content

- Activities related to IEC 61850
- Function modeling
- Enhanced specification and design workflow

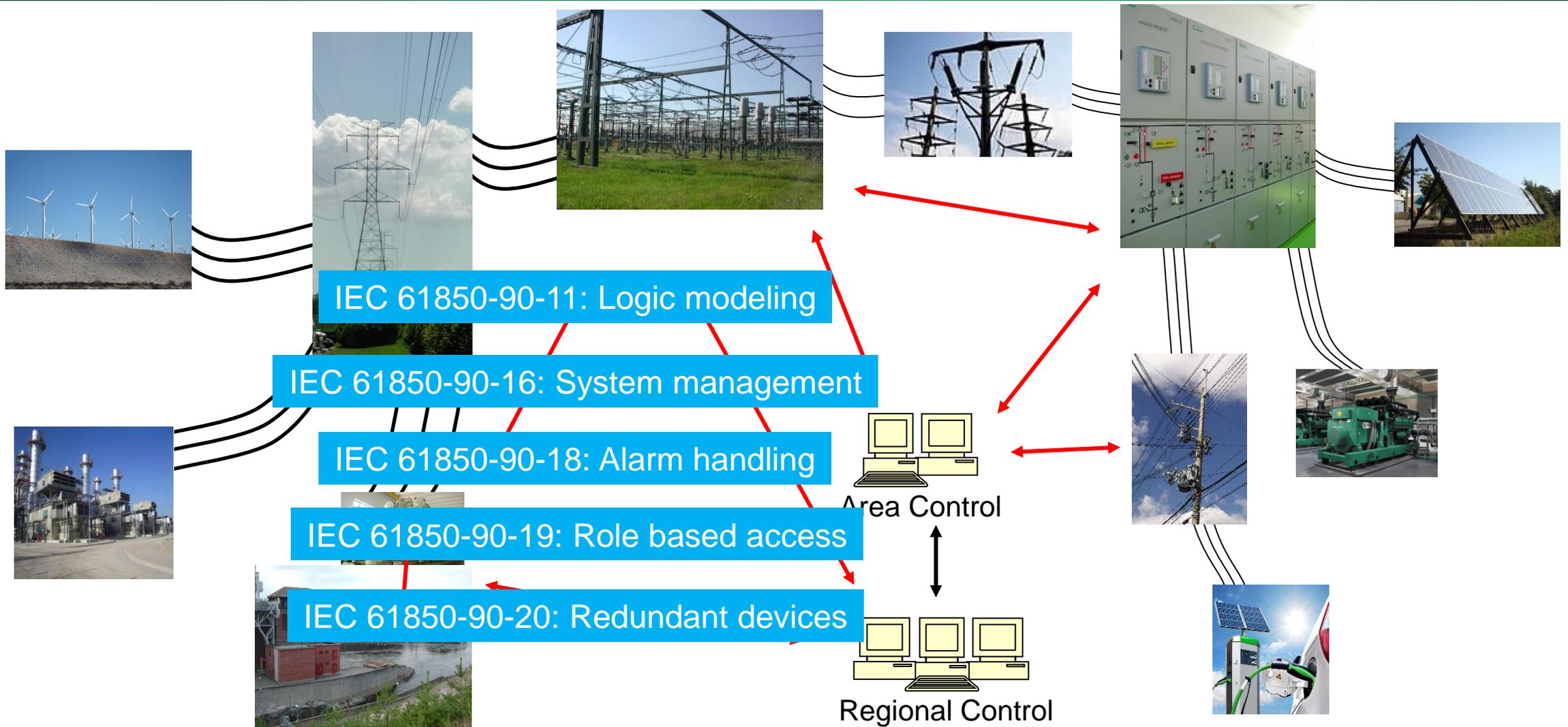
Extended scope of IEC 61850



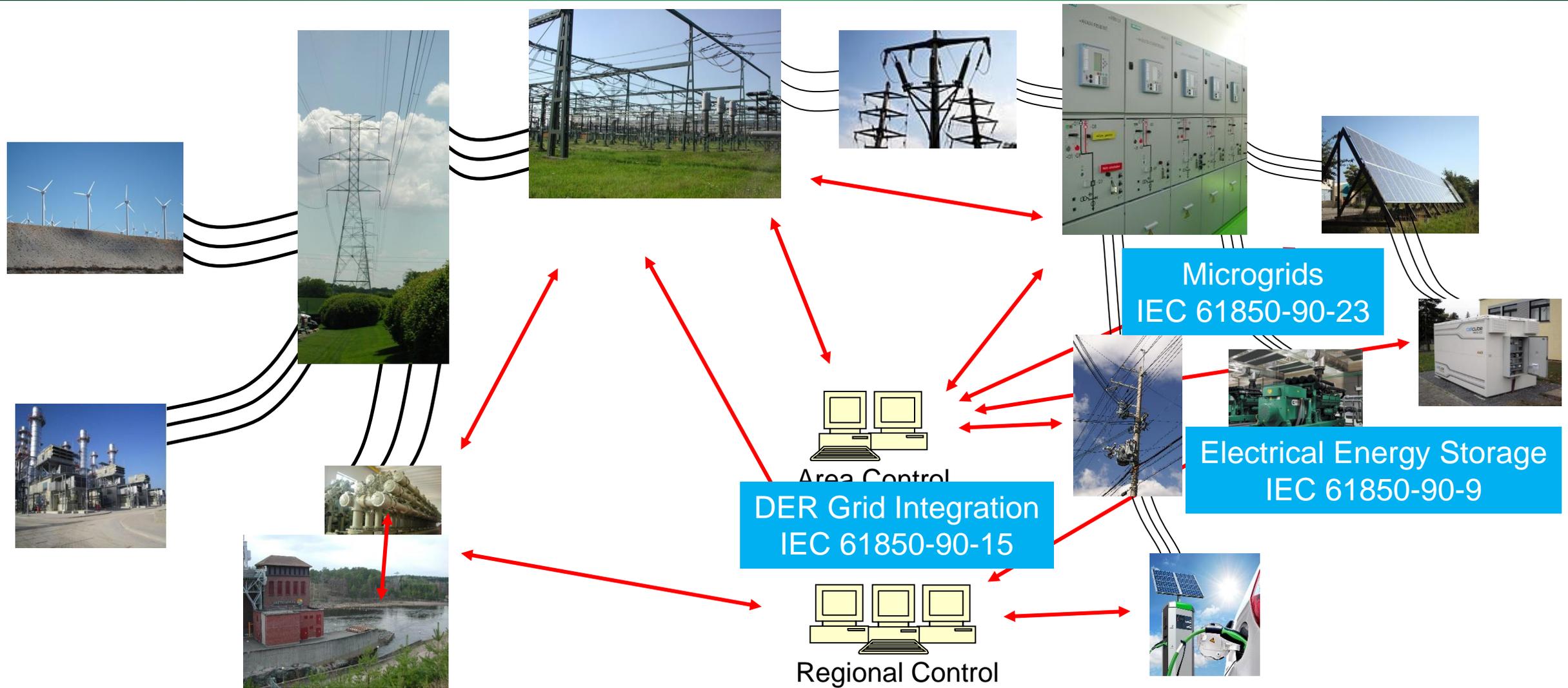
New Domains



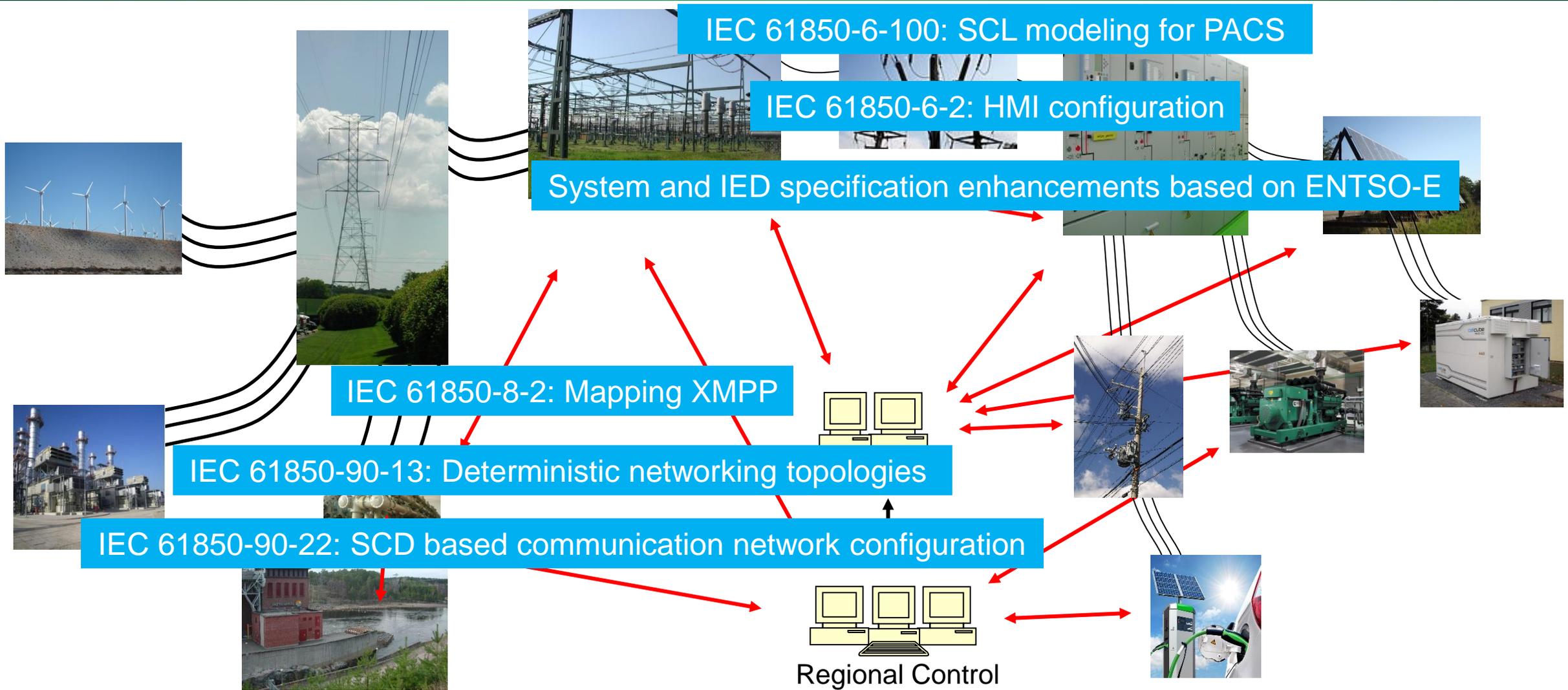
Improving Usability and Security



Distribution Network



Further Extensions

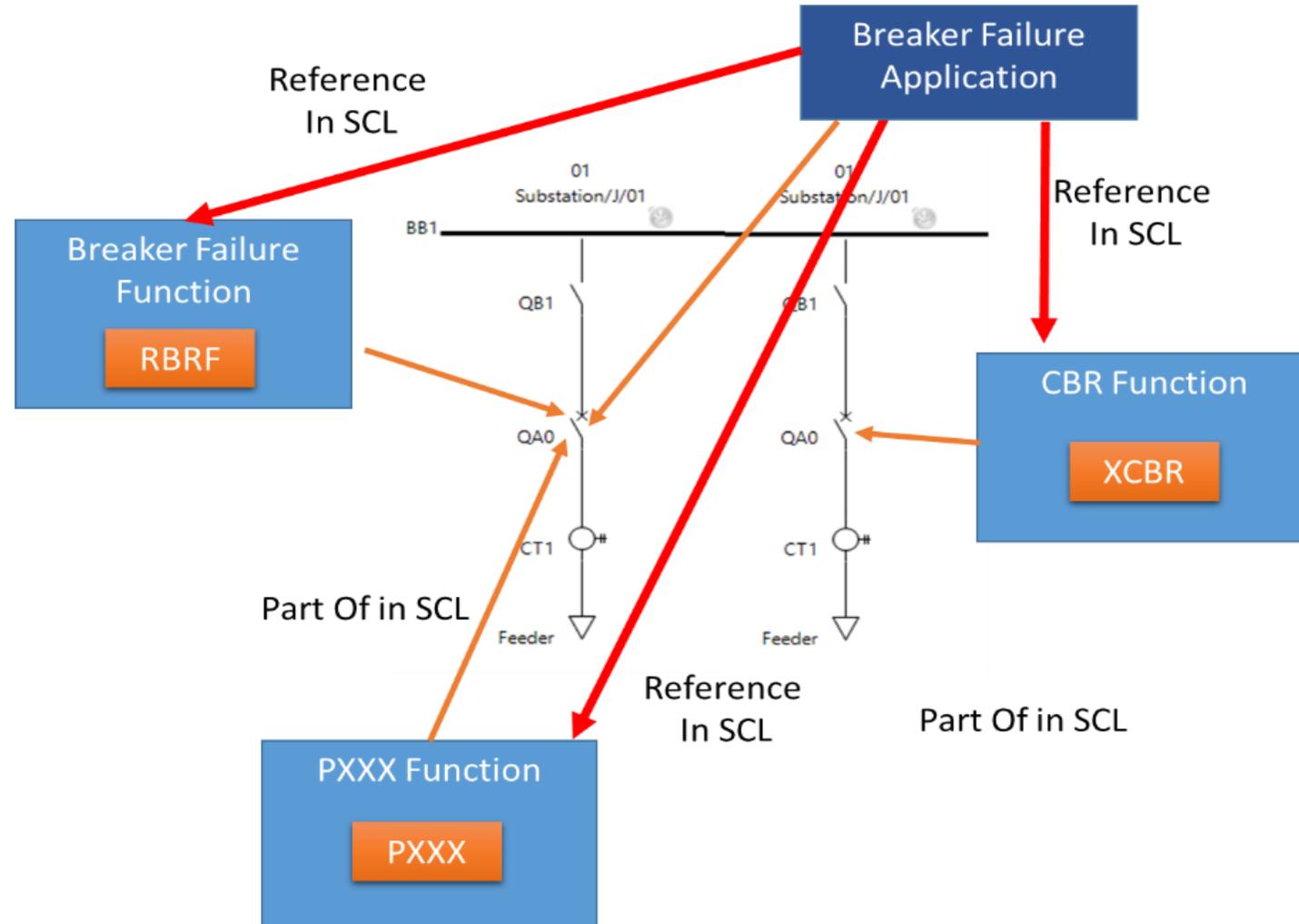


Function modeling - Problem

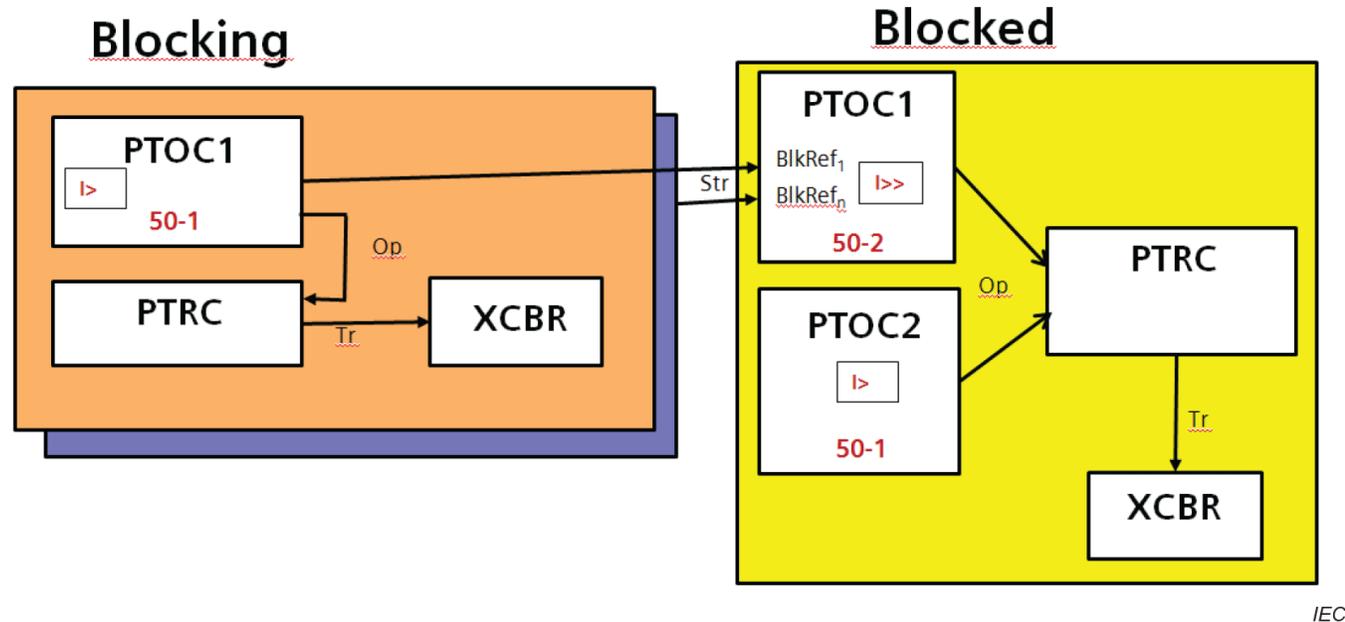
- LN semantic provides the semantic of the class, but not of the instance
 - XSWI is a disconnecter – but which one?
 - PDIS is a distance element – but which zone?
 - Which one is the earth fault, which one the phase fault?
- Prefixes may be used (e.g. **QB1**XSWI) but are not standardized
- Impact
 - Weak documentation

SCL Extension

Application Scheme



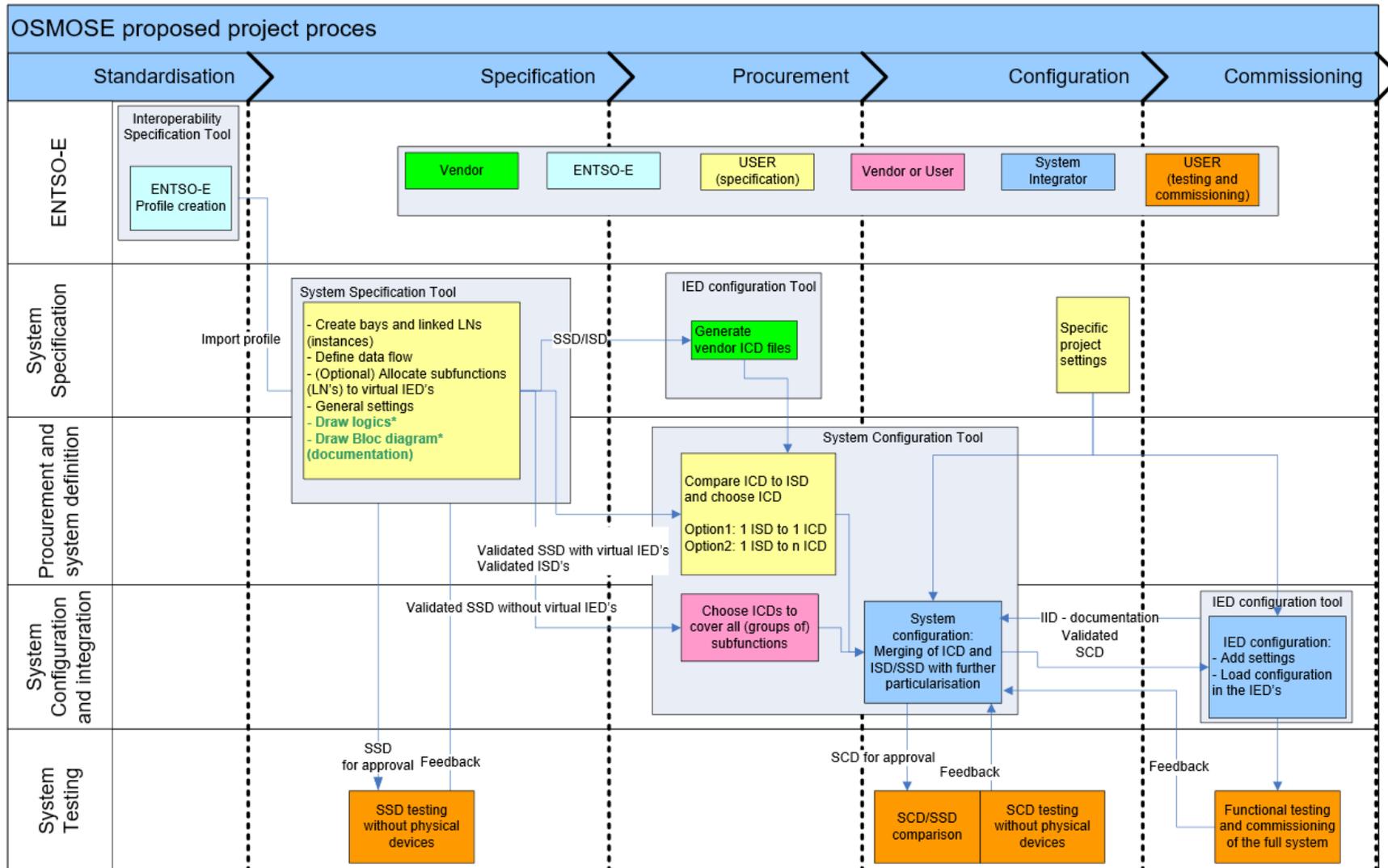
BAP – defining the Application



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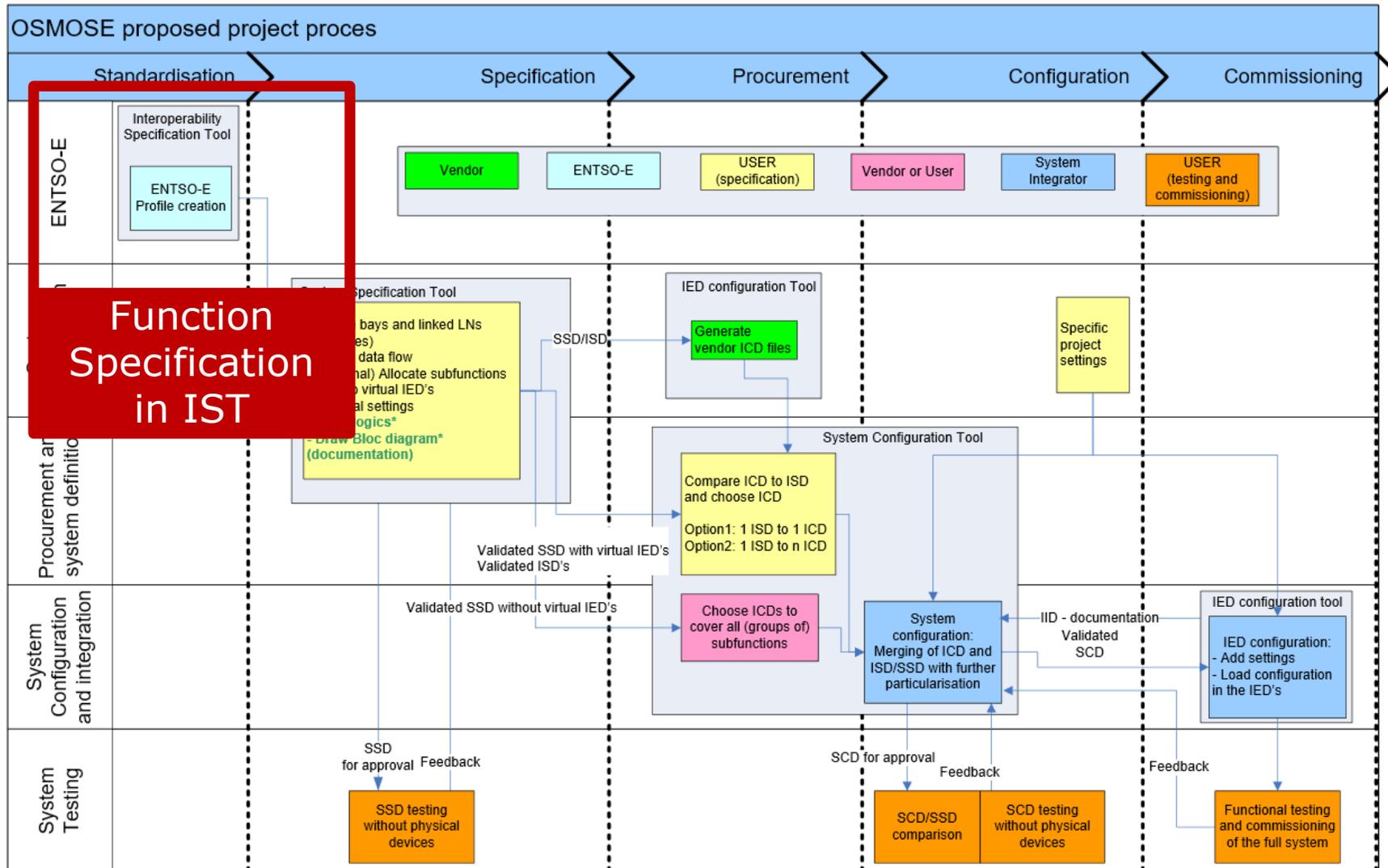
```
<!-- shall we be able to list multiple voltage levels to which to
<Application name="TEMPLATE" type="BAP Reverseblocking FBMBTA">
  <!-- could we use a concept of Application template in a simi
  <!-- asses the usage of the role concept in general for part
  <Role multi="1" name="blocked Function">
    <FunctionRef ref="BAP Example/20kV/Incomer/Incomer Protec
  </Role>
  <Role multi="1..*" name="blocking Function">
    <!-- multi is only allowed for name=TEMPLATE -->
    <FunctionRef ref="BAP Example/20kV/Feeder/Feeder Protecti
  </Role>
  ..
  ..
```

ENTSO-E approach



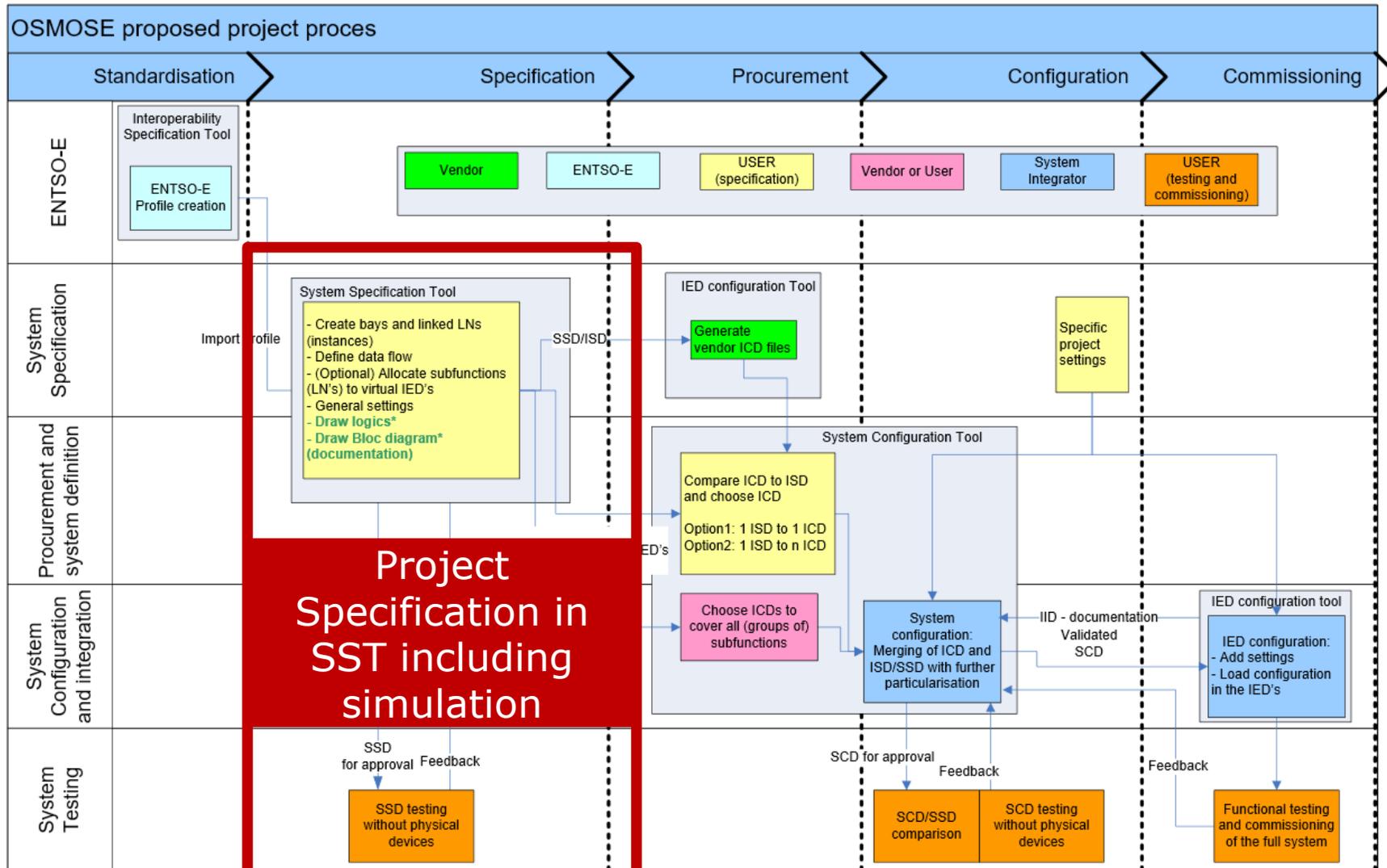
* Not implemented for OSMOSE project

ENTSO-E approach



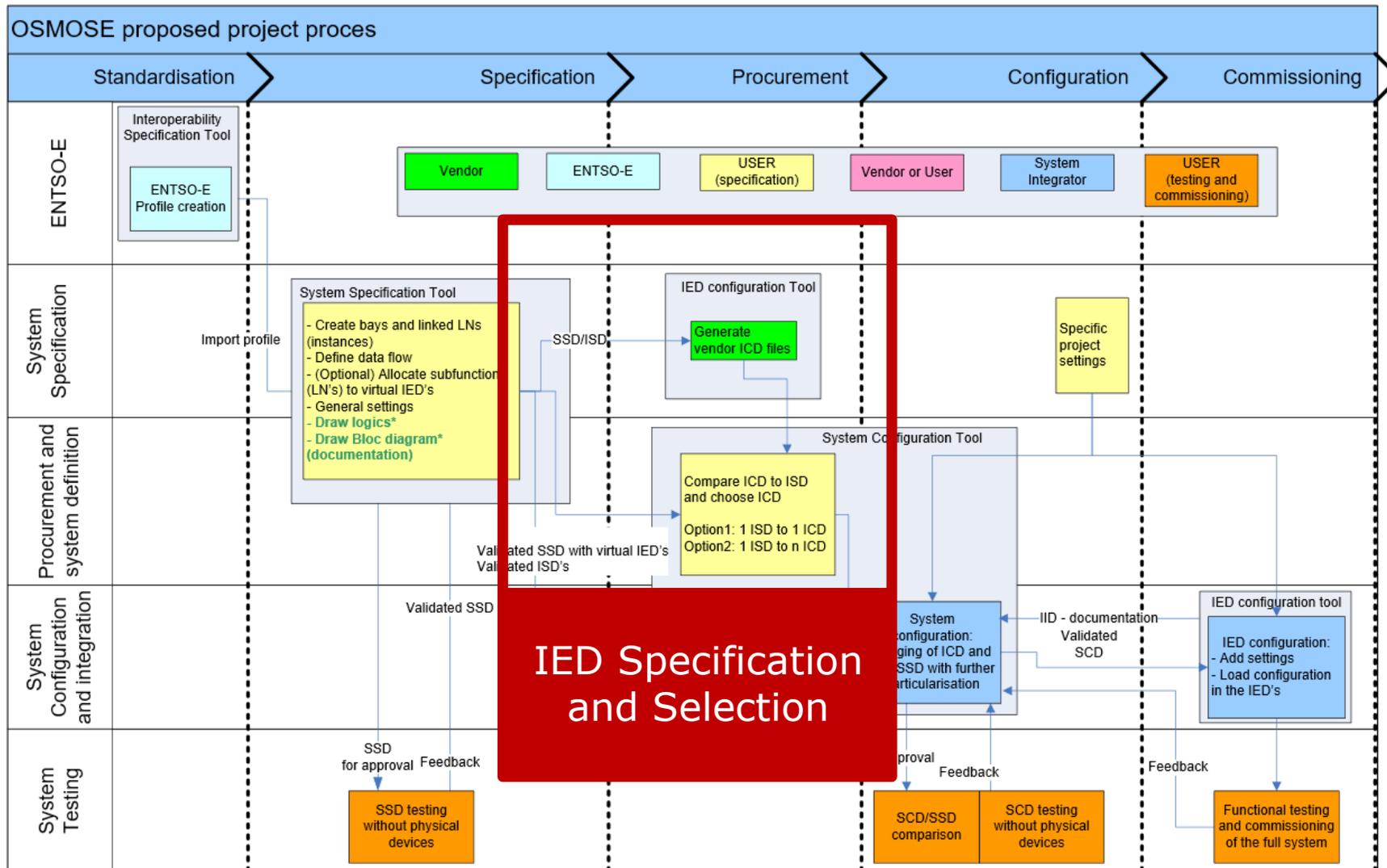
* Not implemented for OSMOSE project

ENTSO-E approach



* Not implemented for OSMOSE project

ENTSO-E approach



* Not implemented for OSMOSE project

SCL Extensions required

- Support virtual signal flow as part of specification
 - In the functional part of SCL / independent of IEDs
 - Using SourceRef in a similar way as ExtRef
 - Include support of value preconfiguration
- IED specification
 - Extend SCL to support IED specification beyond 61850 related aspects

Conclusion

- Significant work is done to enhance the design and engineering efficiency
- Users and vendors collaborate to achieve the goal – the ENTSO-E approach is currently prototyped in the European Research Project OSMOSE



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