Intelligent Universal Transformer Design and Applications

Session 1

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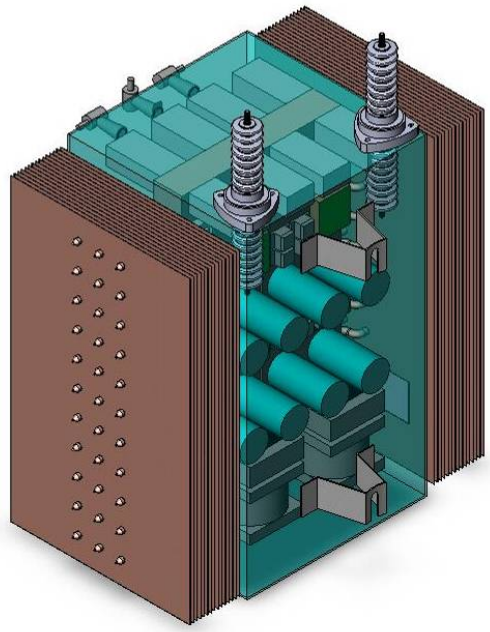
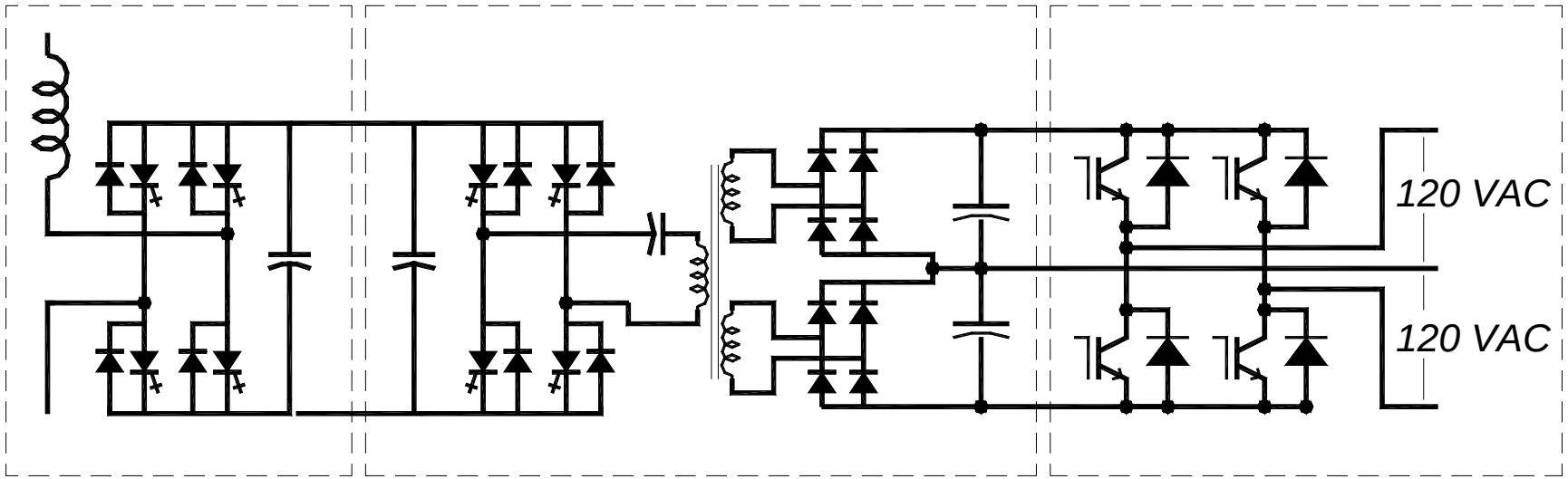
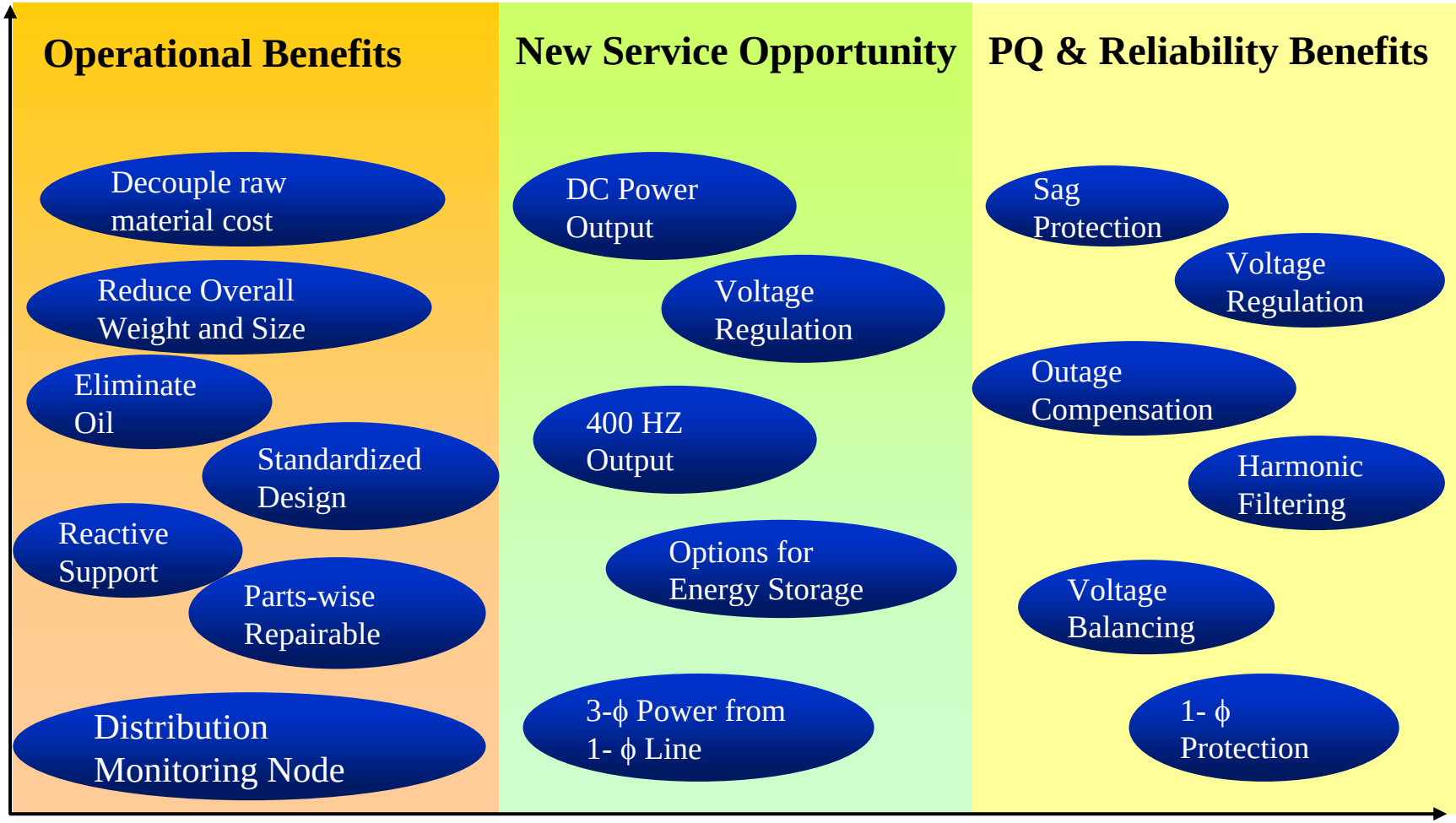


What is the IUT™?



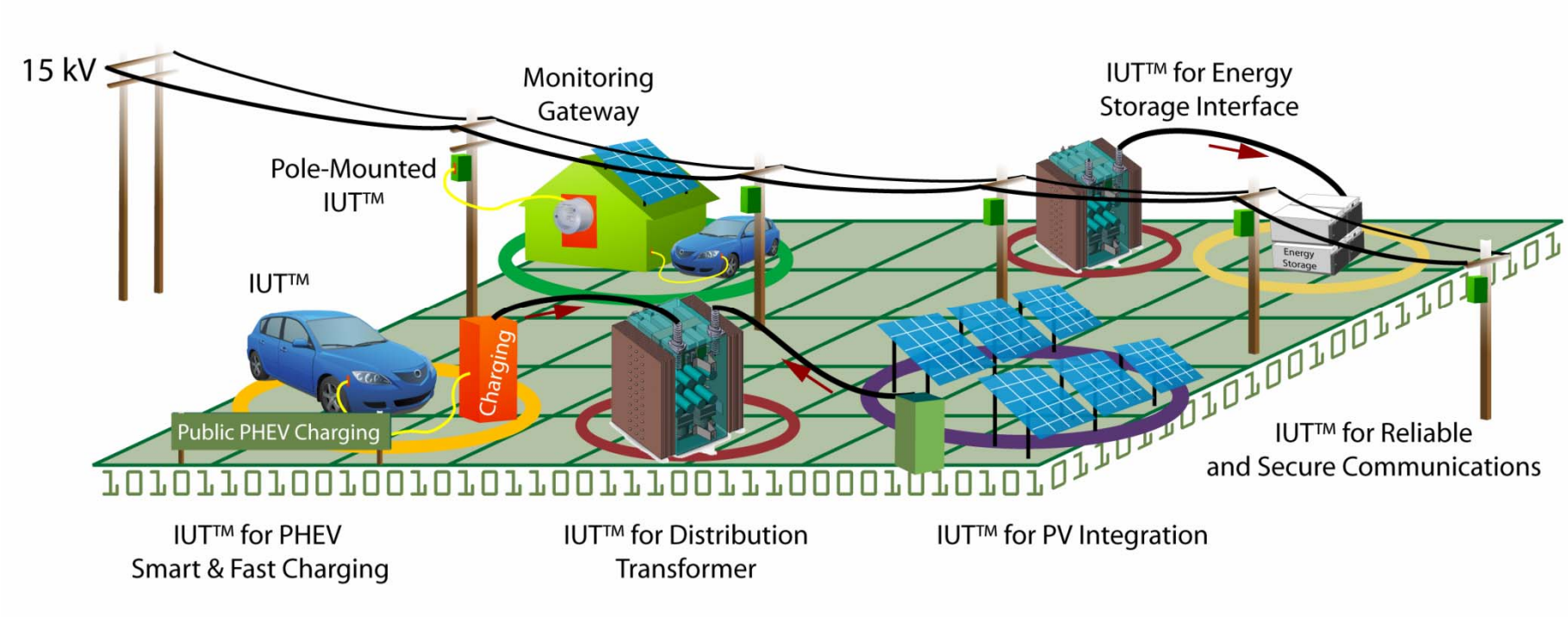
IUTApplications



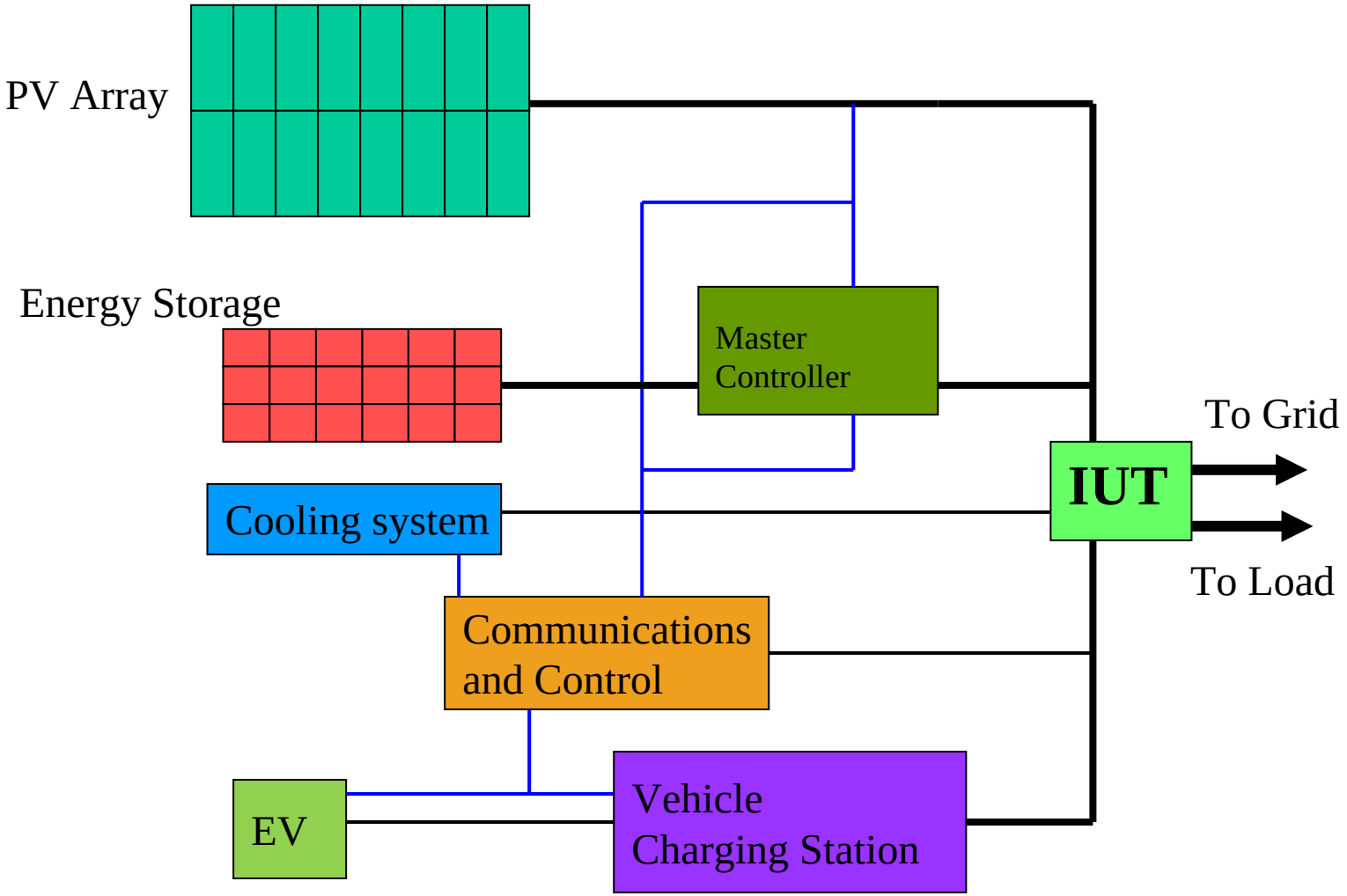
IUT Functions in the Smart Grid

- Voltage control (enable implementation of conservation voltage control with complete controllability at the local level)
  - Significant energy savings potential
  - Demand management
- Integration of storage and renewables with the IUT
  - Significant advantages for storage at IUT (multiple customers combined) compared to storage at individual customers
  - Facilitates integration of intermittent renewables (PV smart inverter)
  - Microgrid applications (reliability improvement)
- Bus and monitoring for PHEV charging
- Improved efficiency at light loads – ideal for applications that involve storage and renewable generation applications

Applications of IUT in a Smart Grid Infrastructure



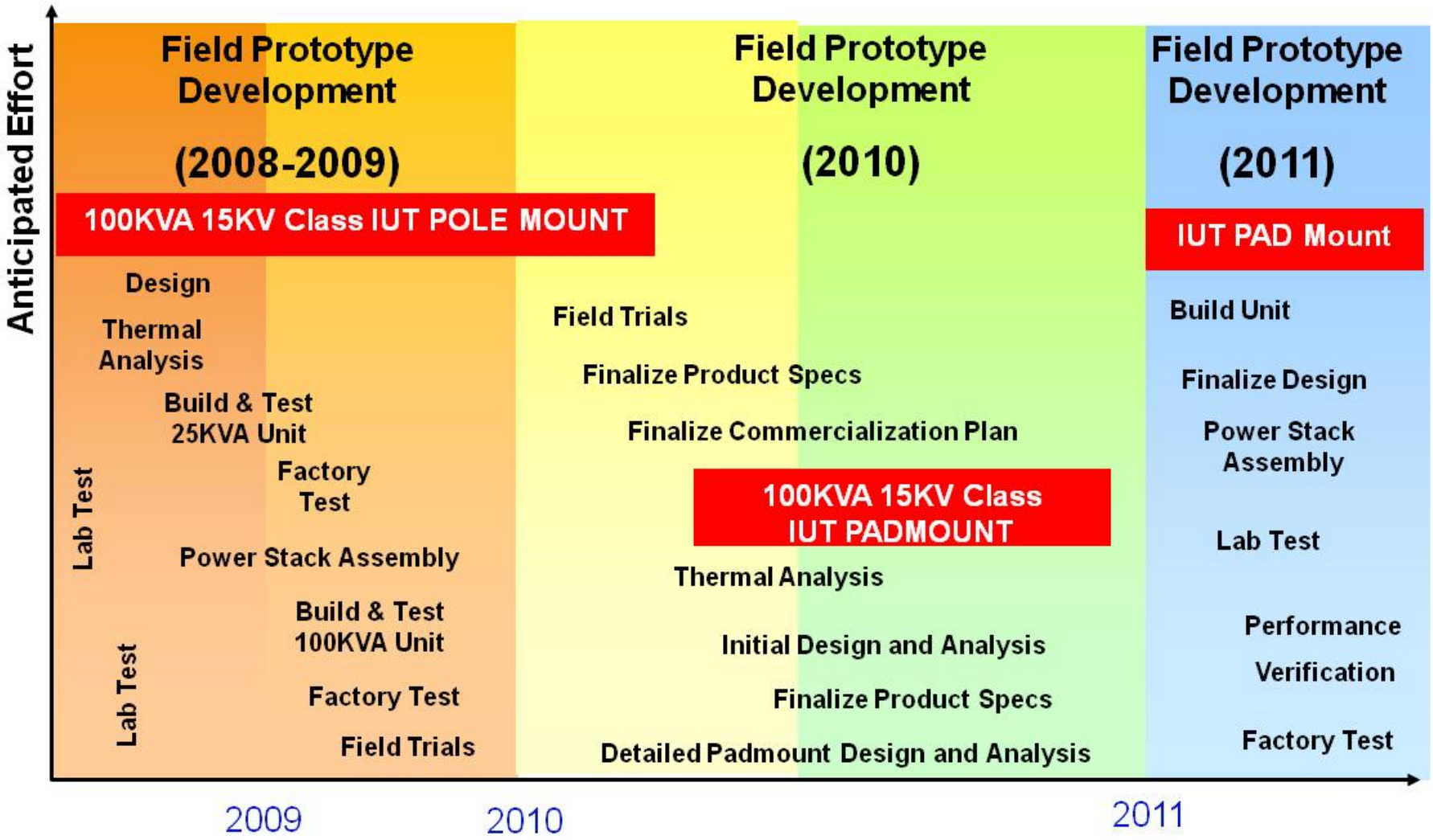
Functional Block Diagram



Loss Considerations

- Conventional transformers have losses that are significant even at light load
  - Core losses dominate a light load
  - Winding losses dominate at heavy loads
- IUT will have higher losses at peak load (e.g. 5%) but can have significantly lower losses at light load.
- This is particularly important for applications involving storage and DG where the transformer load is often very low.

Development Plans



Questions?