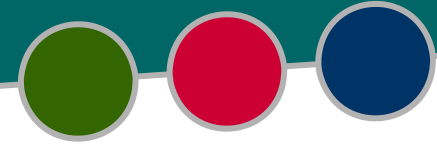


Power System Controls: Today and Future

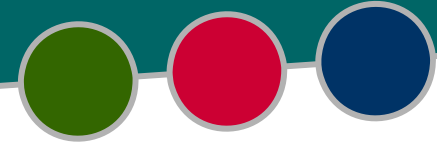
Anjan Bose
Washington State University
Pullman, WA, USA

IEEE Distinguished Lecture
Zagreb, Croatia
June, 2010



What is a SMART Grid?

- **Self-heals**
- **Motivates and includes the consumer**
- **Resists attack**
- **Provides power quality for 21st century needs**
- **Accommodates all generation and storage options**
- **Enables markets**
- **Optimizes assets and operates efficiently**

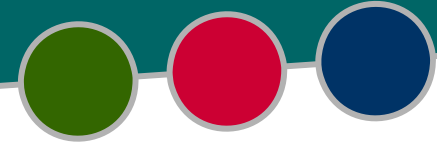


Transmission vs Distribution

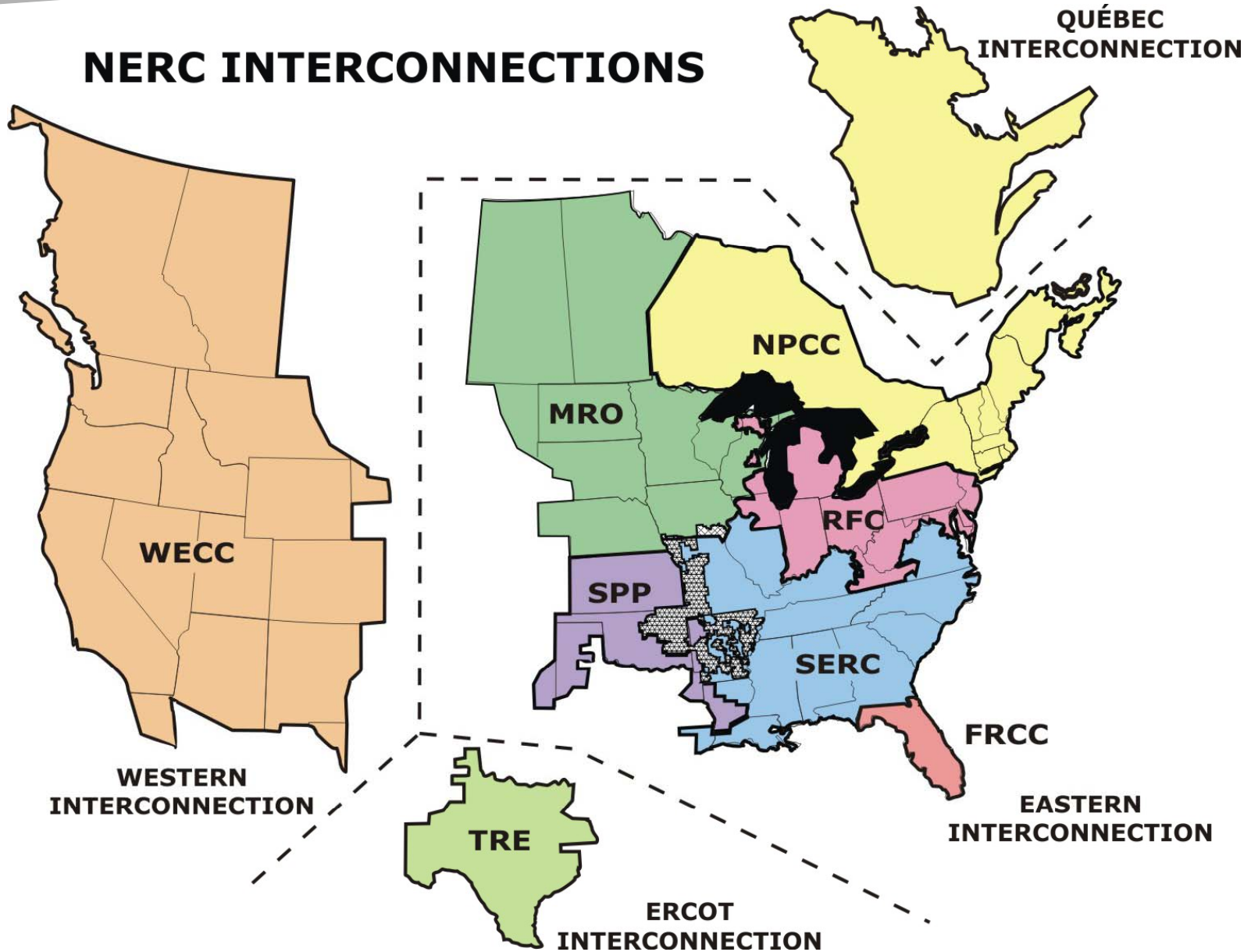
- **Smart Meters**
- **Demand side load control**
- **Distribution automation (including two-way flow)**
- **Micro-grids**
- **Real-time pricing**

Will talk mainly about Transmission

- **Prevent cascading blackouts**
- **Wide-area control**

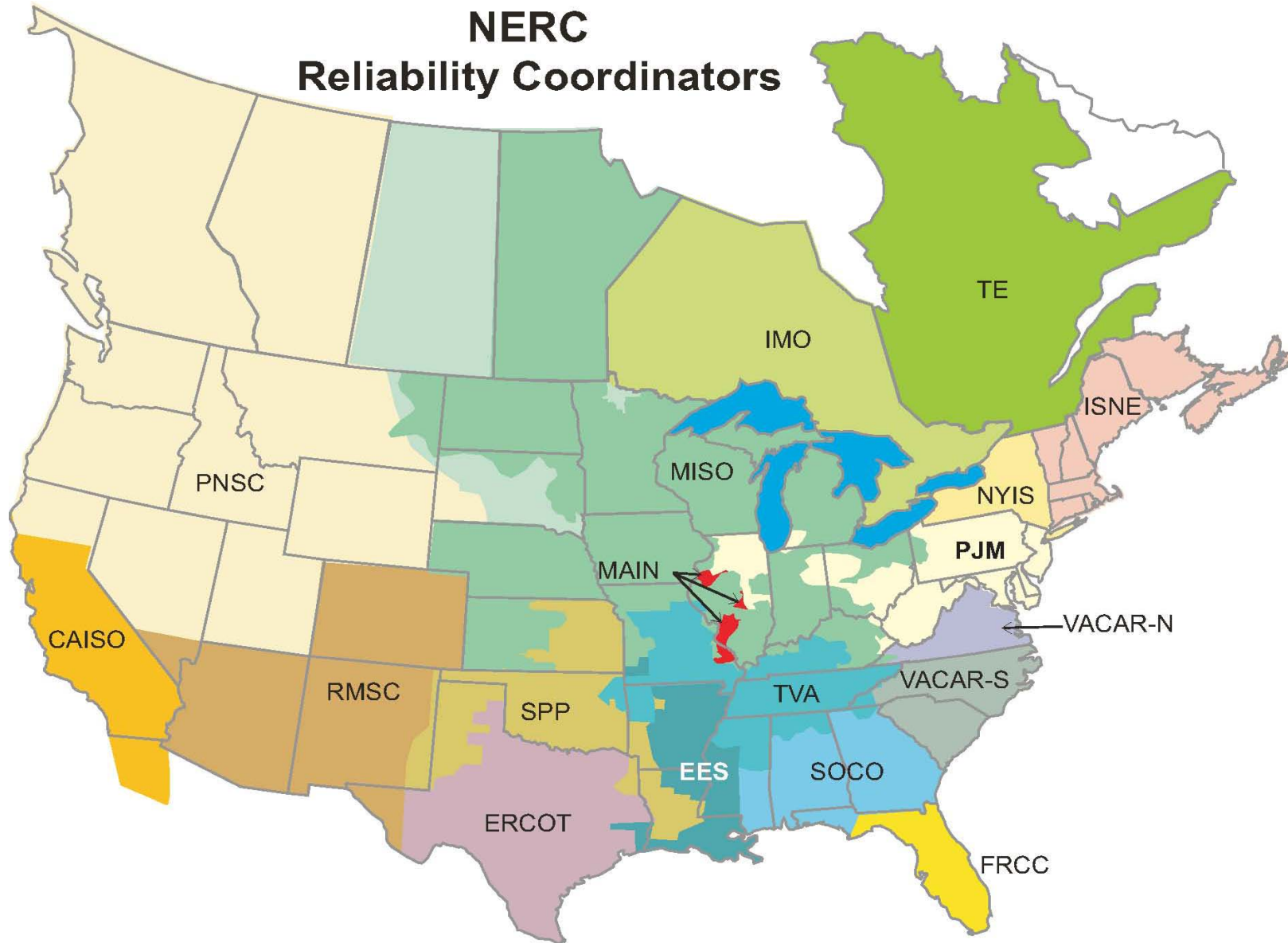


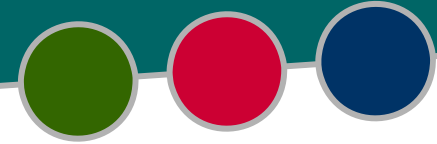
NERC INTERCONNECTIONS



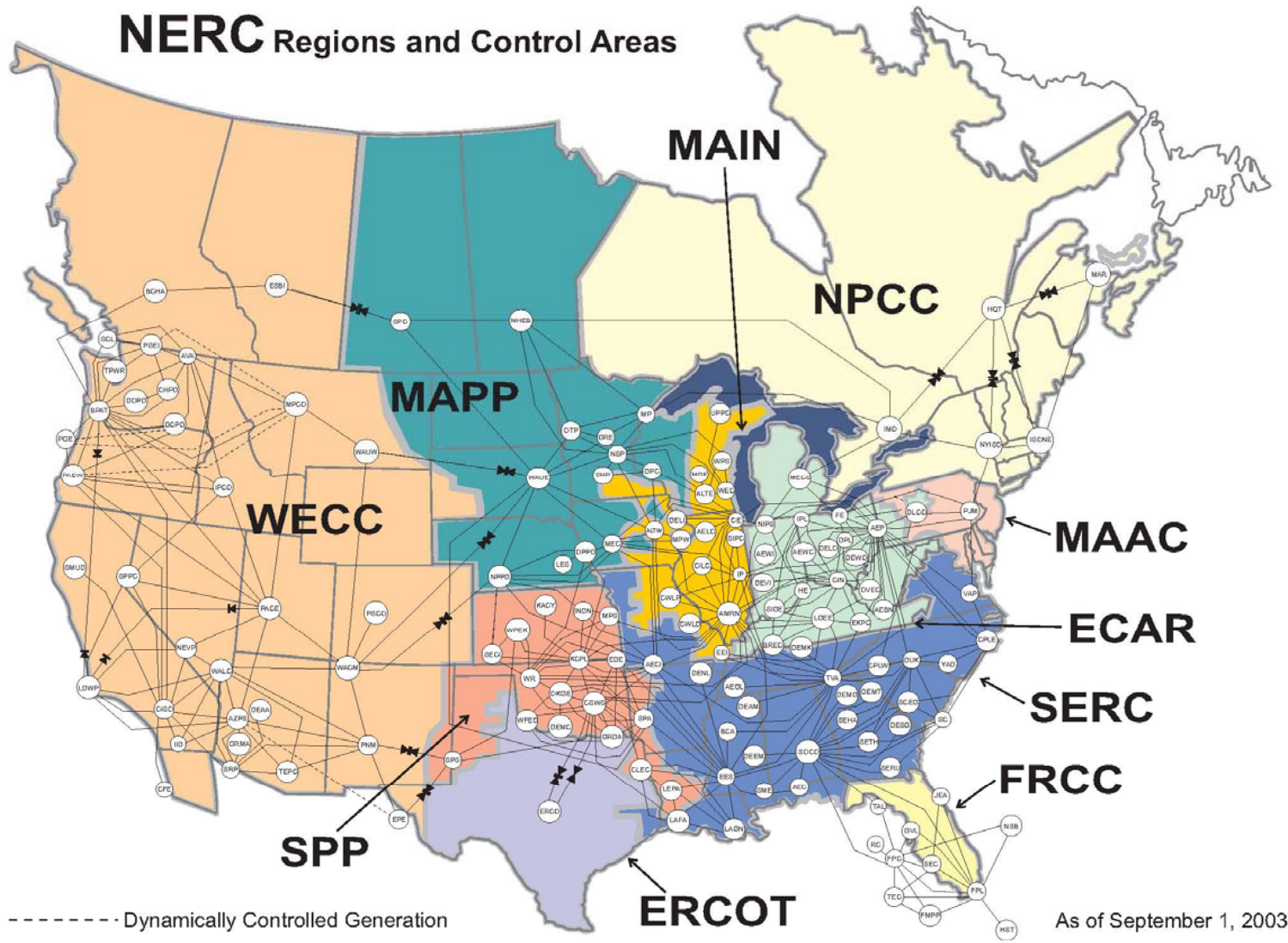


NERC Reliability Coordinators



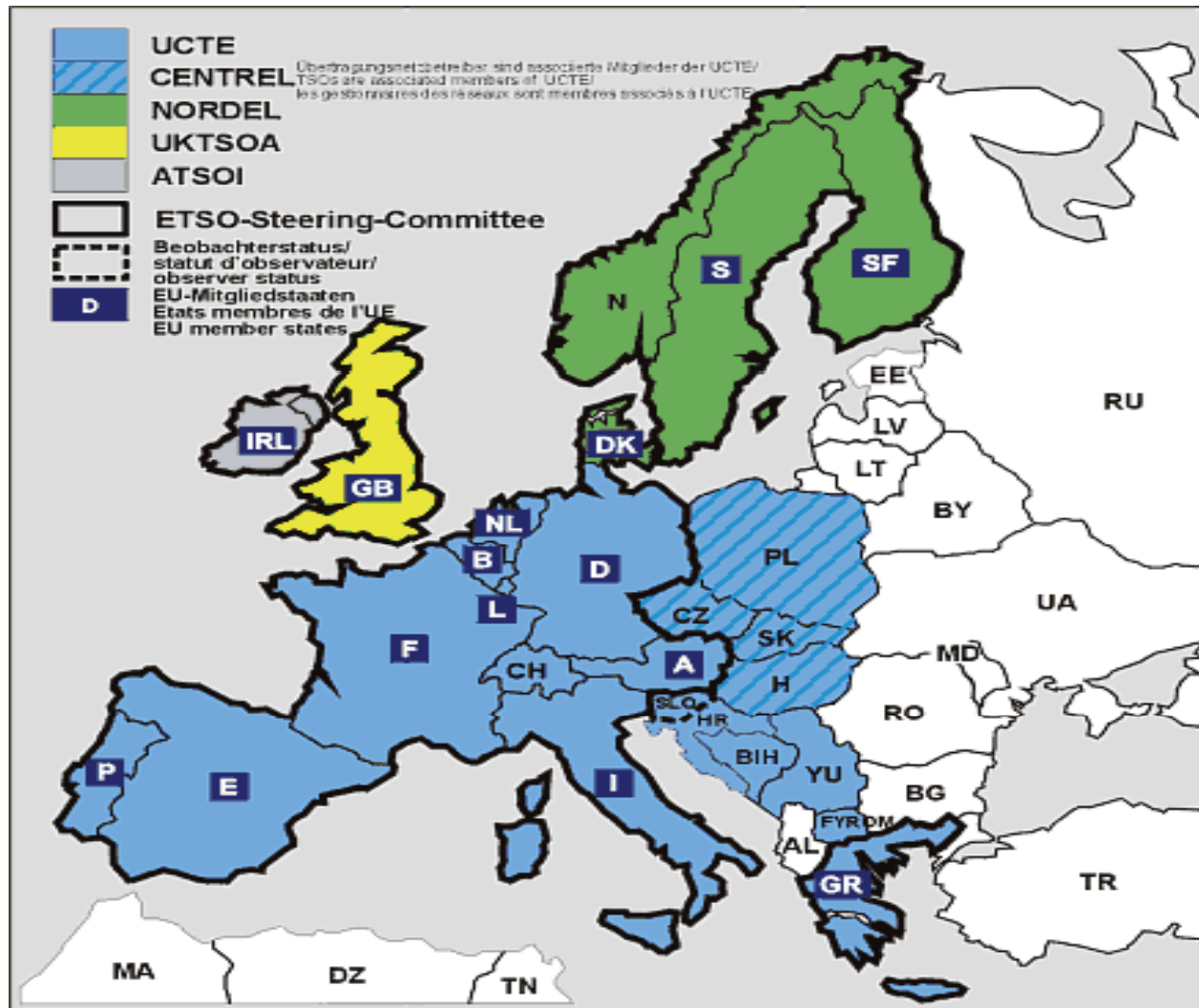


Balancing Authorities





West European Power Grid



China Grid

