

NEMA Smart Grid Standards Activities

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NEMA Standards Activities

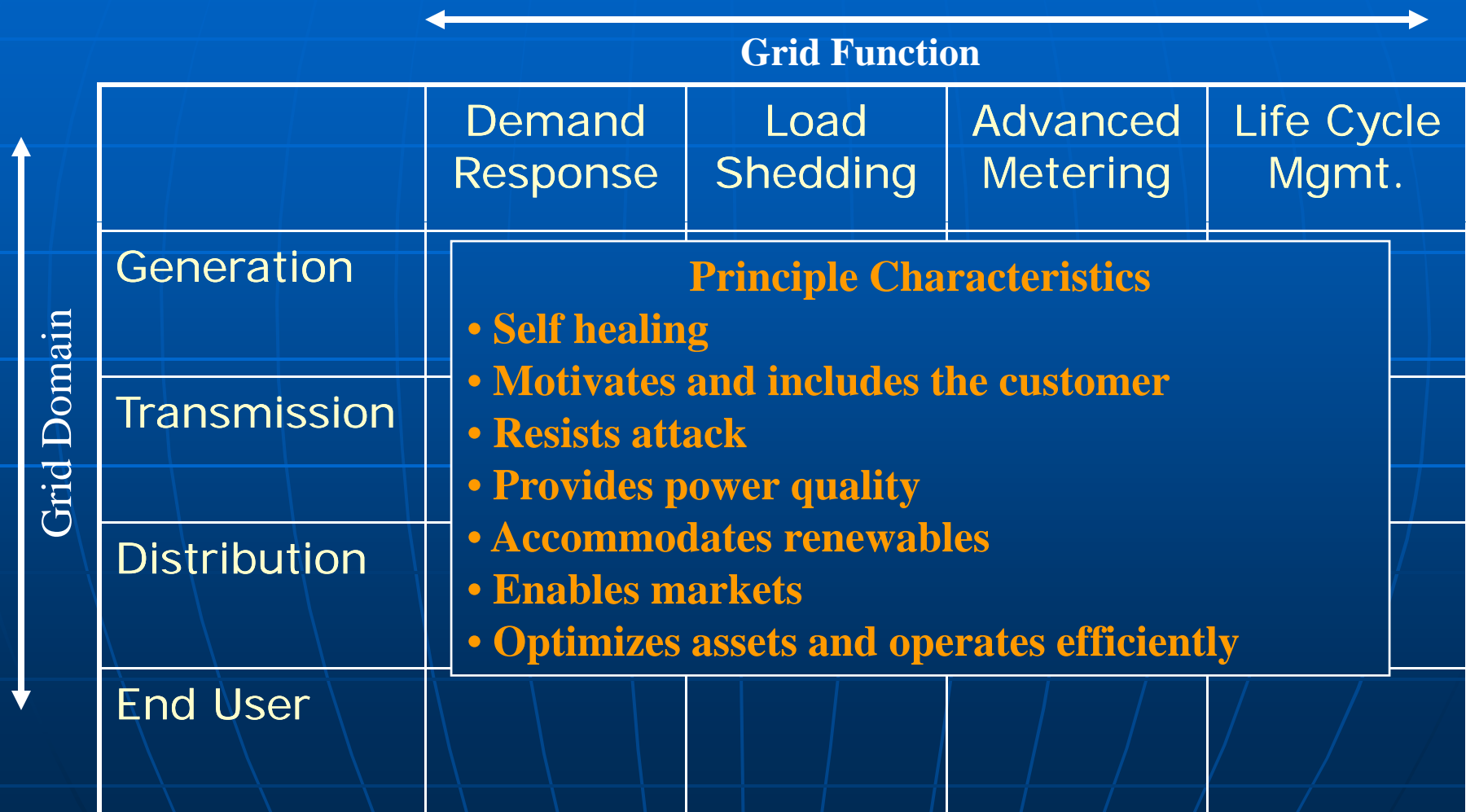
- Product groups (NEMA, ANSI, other)
 - Hardware standards (transformers, switchgear, meters, motors, lighting, controls, cables, connectors, etc.)
- Individual company
 - Input on specific issues (ie. Interoperability stds.)
- Project teams
 - Horizontal issues (Levels of Intelligence)
 - Policy level (ie. NIST activity)

Interoperability Standards

"Give us your assessment of SG Interoperability Standards"

Smart Grid Interoperability	Manufacturer Assessment
Application level	Many available, variable, some needed (i.e. HAN applications)
Control Protocols	Workable protocols exist at all levels but solutions too varied
Communications Protocols	Applications vary, May be overuse of Internet, Internet not most reliable way
Basic Connectivity	Adequate standards exist
Security	Everyone agree--many have security implementation

Intelligence Applied to Smart Grid—"How smart is smart?"



Levels of Intelligence

0	Manual Execution	No observability or controllability
1	Electronic Digital Communication	State reporting and/or remote actuation
2	Self Actuation or Automation	Local device control
3	Self Optimization	Adaptive behavior or performance
4	Collaboration	Multiple devices
5	Planning	Predictive Systems

Standards Recommendations

- Grid areas and potential standards that could be adopted quickly

Grid Domain

Candidate Standards

- | | |
|--------------------------------|---------------------------|
| ■ Substation Automation | IEC 61850 |
| ■ Meter Com Networks | ANSI C12.22 |
| ■ Meters | ANSI C12.19 |
| ■ HAN and Res Controls Energy, | Zigbee, Smart ClimateTalk |

International Standards

- IEC SG-3 Smart Grid Strategy Group
- US Advisory Committee
- NEMA Supports Global Standards for Smart Grid
- US industry must step up