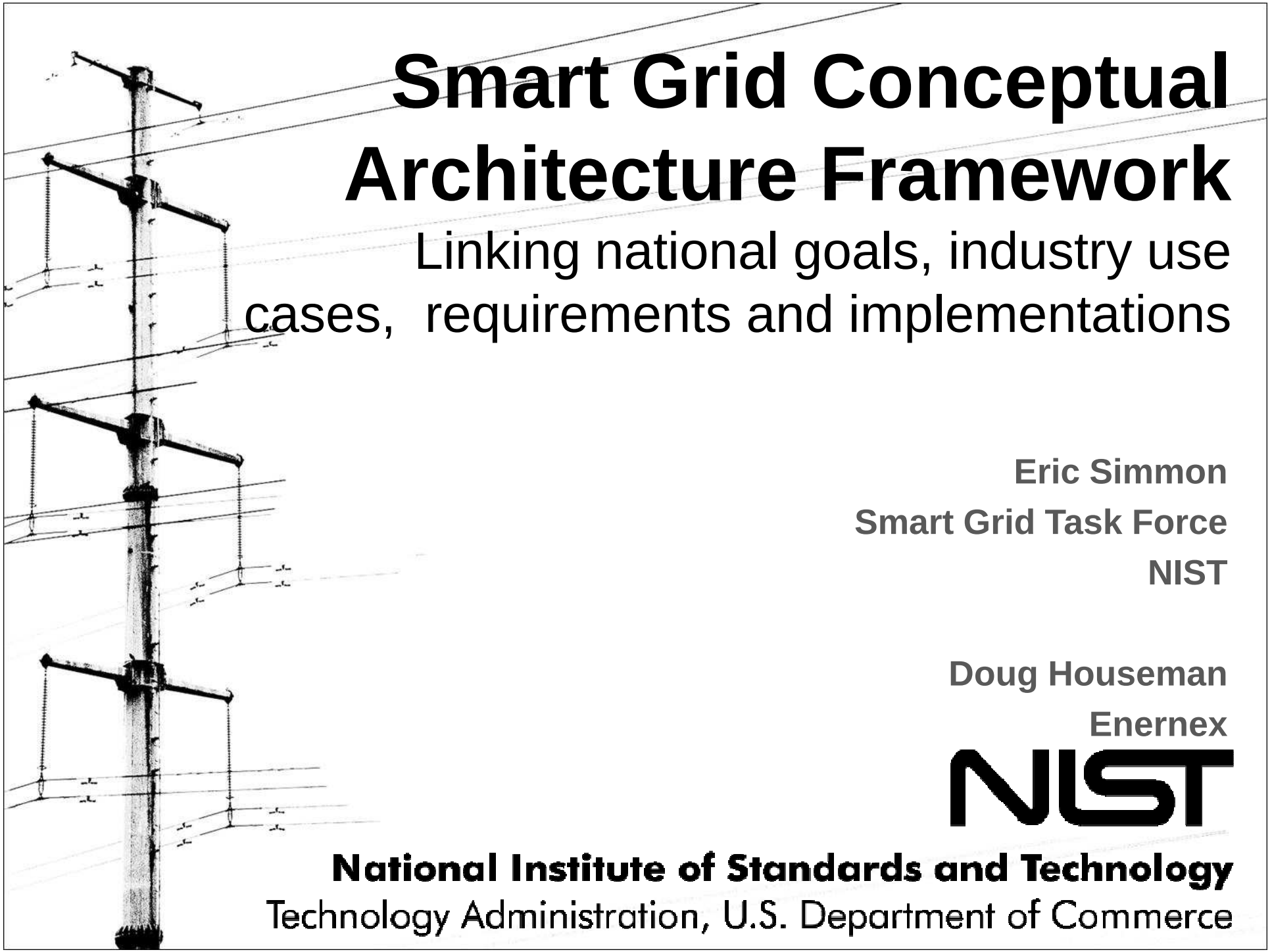


Smart Grid Conceptual Architecture Framework

Linking national goals, industry use cases, requirements and implementations

Eric Simmon

Smart Grid Task Force

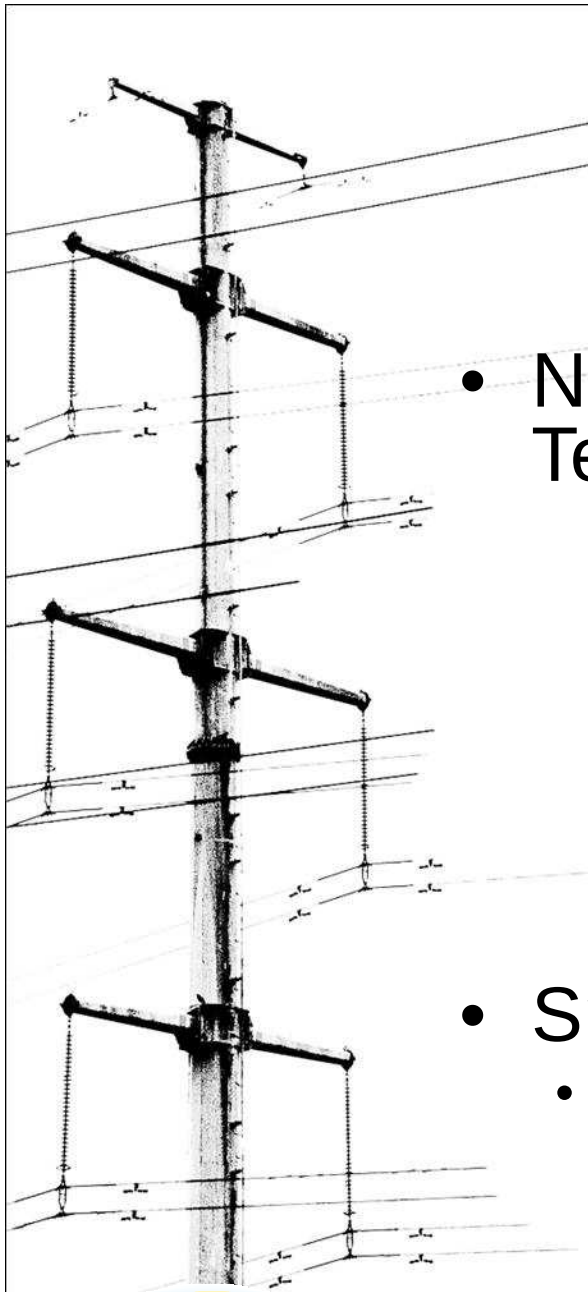
NIST

Doug Houseman

Enernex

National Institute of Standards and Technology

Technology Administration, U.S. Department of Commerce



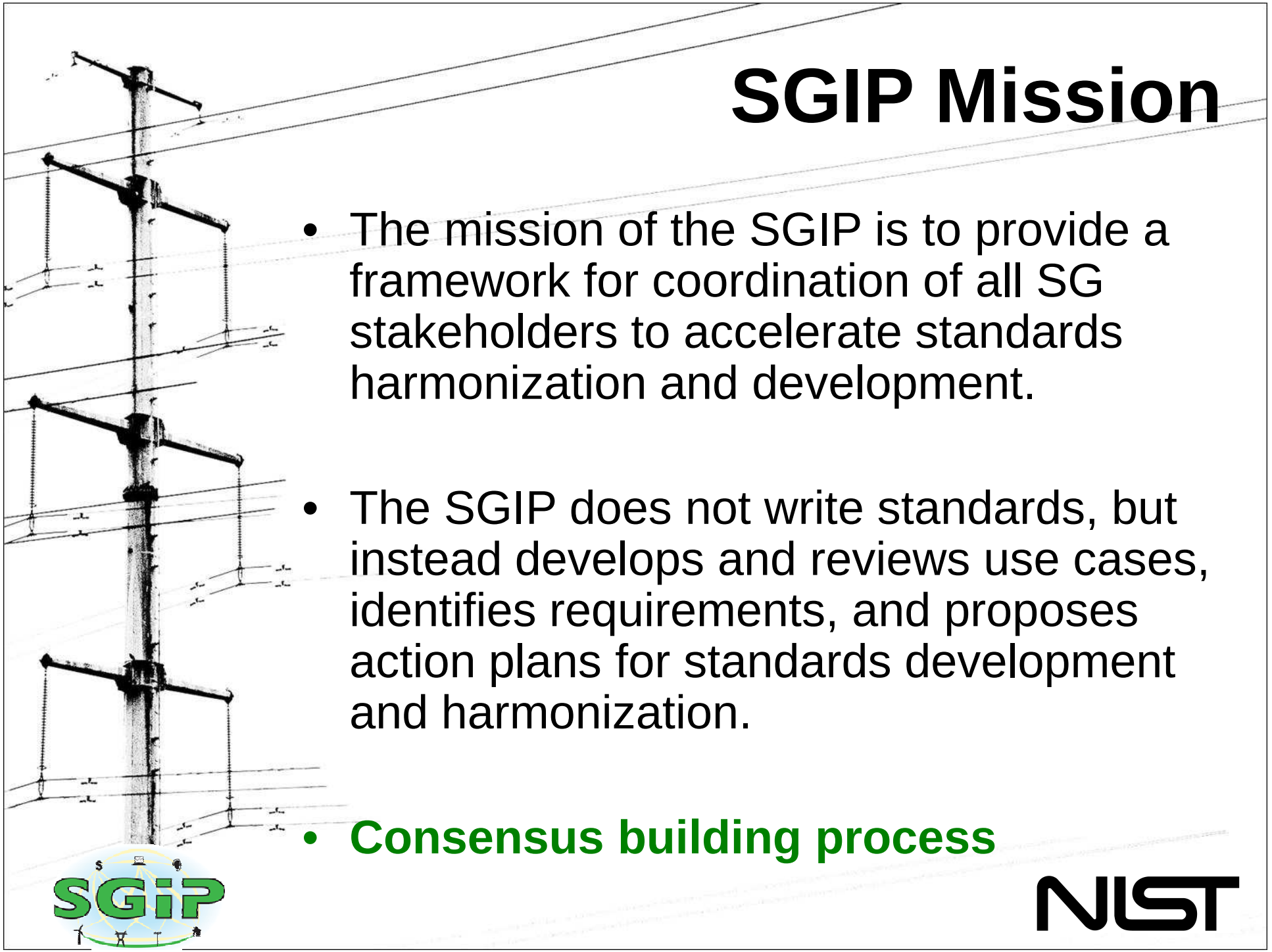
Background

- National Institute of Standards and Technology (NIST)

  "Primary responsibility to coordinate development of a framework that includes protocols and model standards for information management to achieve interoperability of Smart Grid devices and systems…"

  [2007 EISA Title XIII, Section 1305]

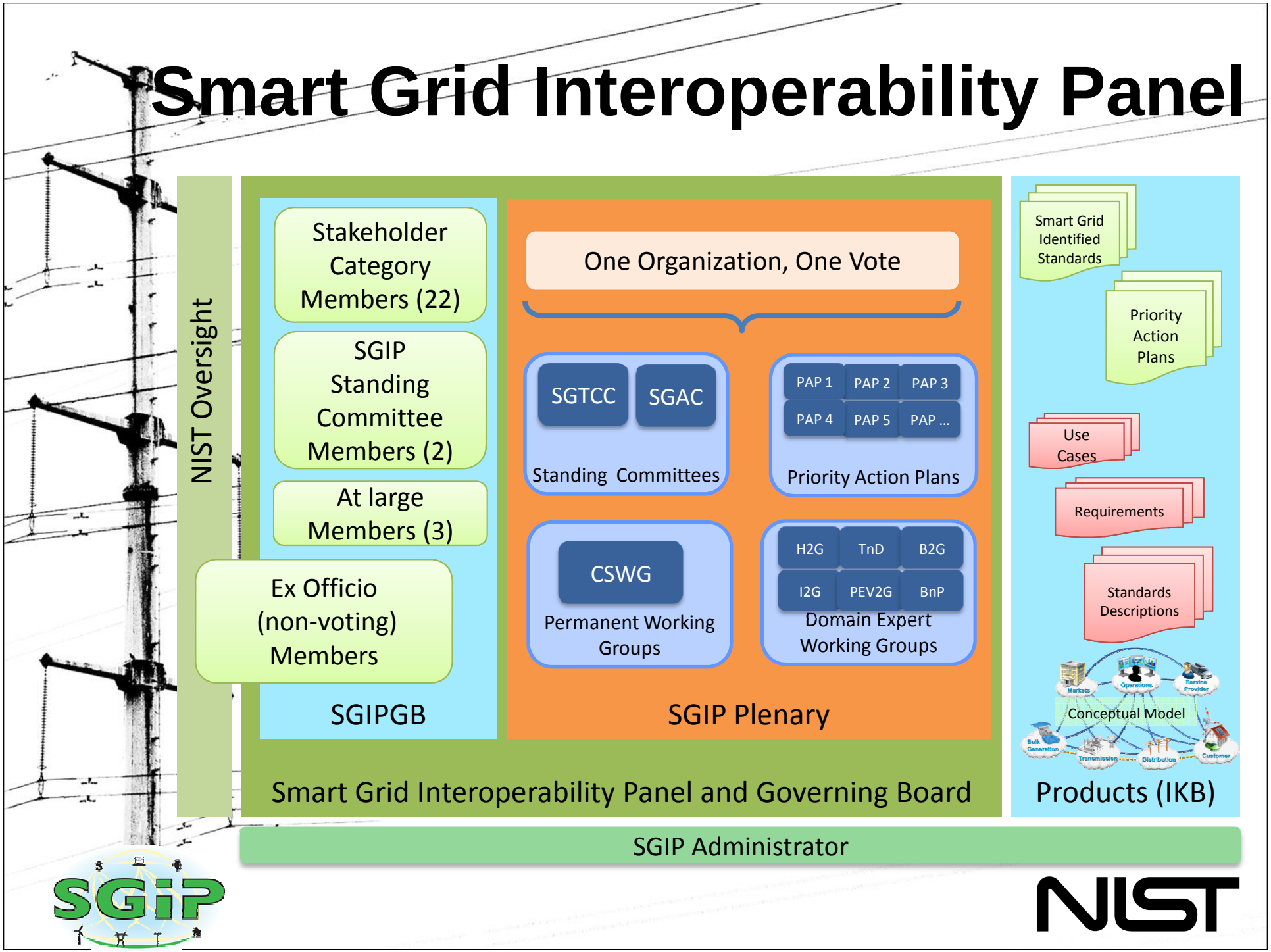
- Smart Grid Interoperable Panel (SGIP)
  - Will support NIST in fulfilling its responsibilities under the 2007 Energy Independence and Security Act.

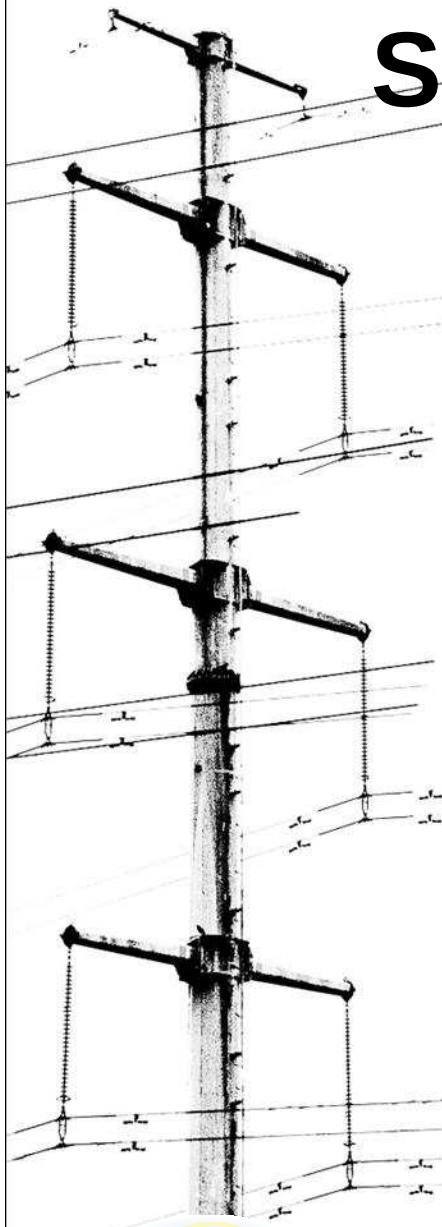


SGIP Mission

- The mission of the SGIP is to provide a framework for coordination of all SG stakeholders to accelerate standards harmonization and development.
- The SGIP does not write standards, but instead develops and reviews use cases, identifies requirements, and proposes action plans for standards development and harmonization.
- **Consensus building process**

Smart Grid Interoperability Panel

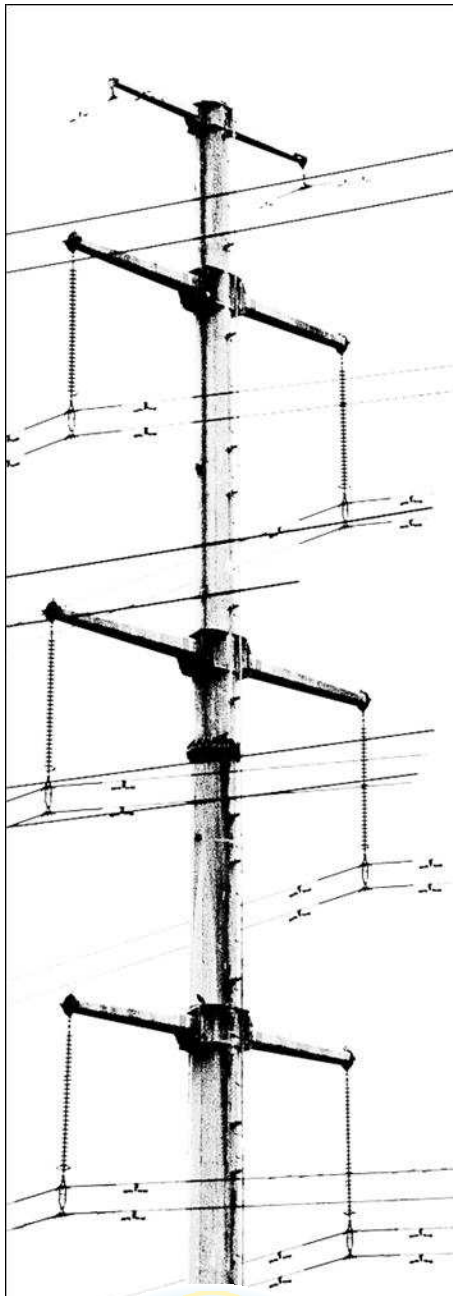




SGIP Smart Grid Architecture Committee

- Development and management of the Smart Grid Conceptual Model and Use Cases
- Overall
- Resource for the SGIP, GB, NIST, and working groups

- Organization
  - 30 members, confirmed by SGIP
  - Selected from recommendations from nominations teams
  - Selection criteria, members, and chair
  - Chairs confirmed by SGIPGB
  - SGAC Chair: Ron Ambrosio, IBM

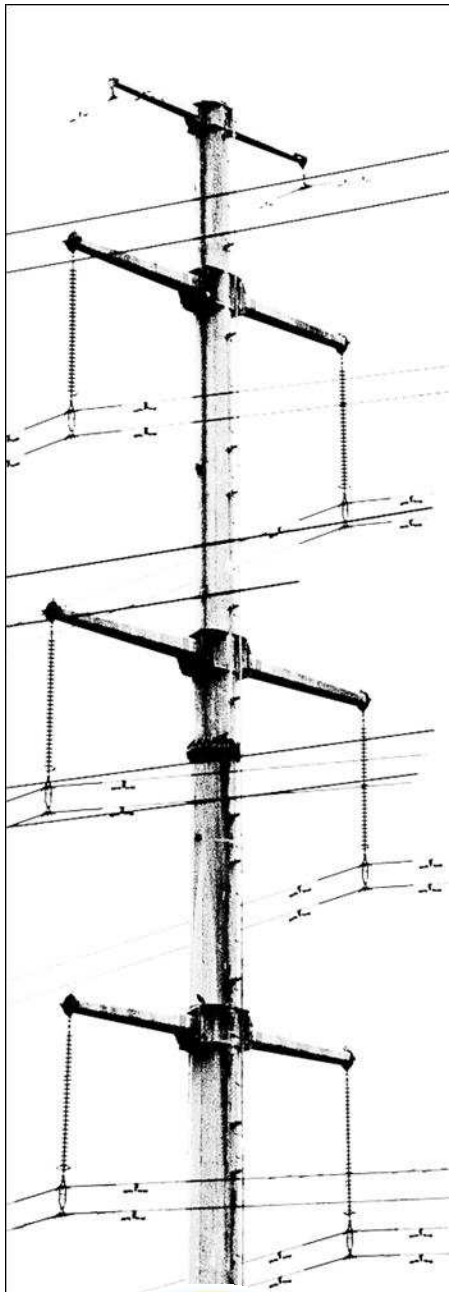


Conceptual Architecture

- What it does
  - Provides traceability from legislated goals to conceptual business services
  - Provides a common vocabulary and building blocks for discussion
  - Provides a basis for understanding what standards are needed
- What it does not:
  - Require a specific technology or process
  - Specify implemented services to be delivered
  - Dictate any organization or services split

SGiP

NIST



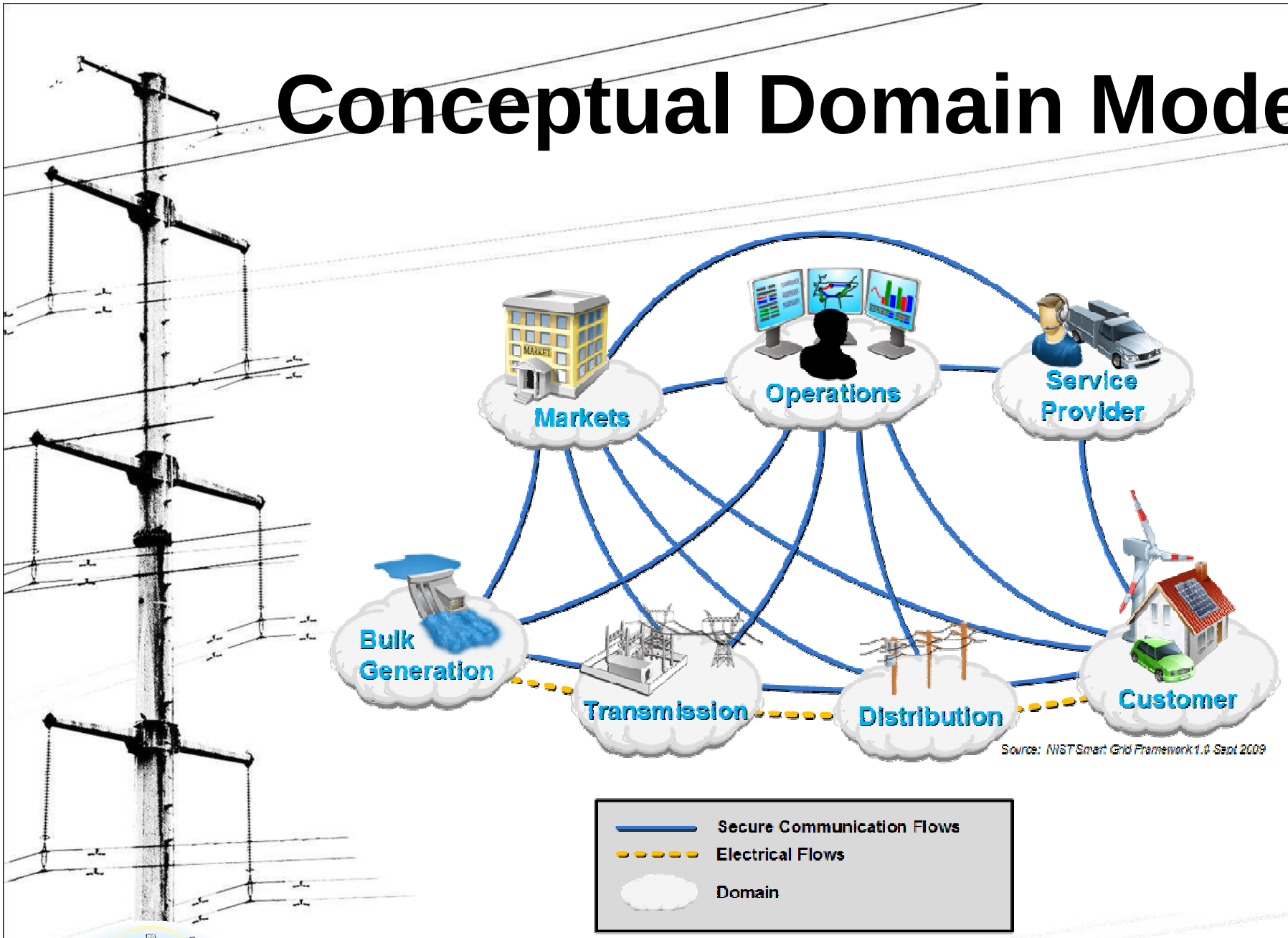
Assumptions

- Inputs
  - NIST Conceptual Model is the basis for the framework
  - Goals derived from national legislation (9500 pages)
  - Use cases (655) and requirements (20 documents) are initially assumed valid
    - Intelligrid, SCE, NIST updates, CSWG
    - New use cases and requirements accepted
  - CSWG materials on requirements will be used for the security requirements
- Process
  - ToGAF is the underlying method
  - Small team will do the “heavy lifting”
  - Outputs will be publically available

SGiP

NIST

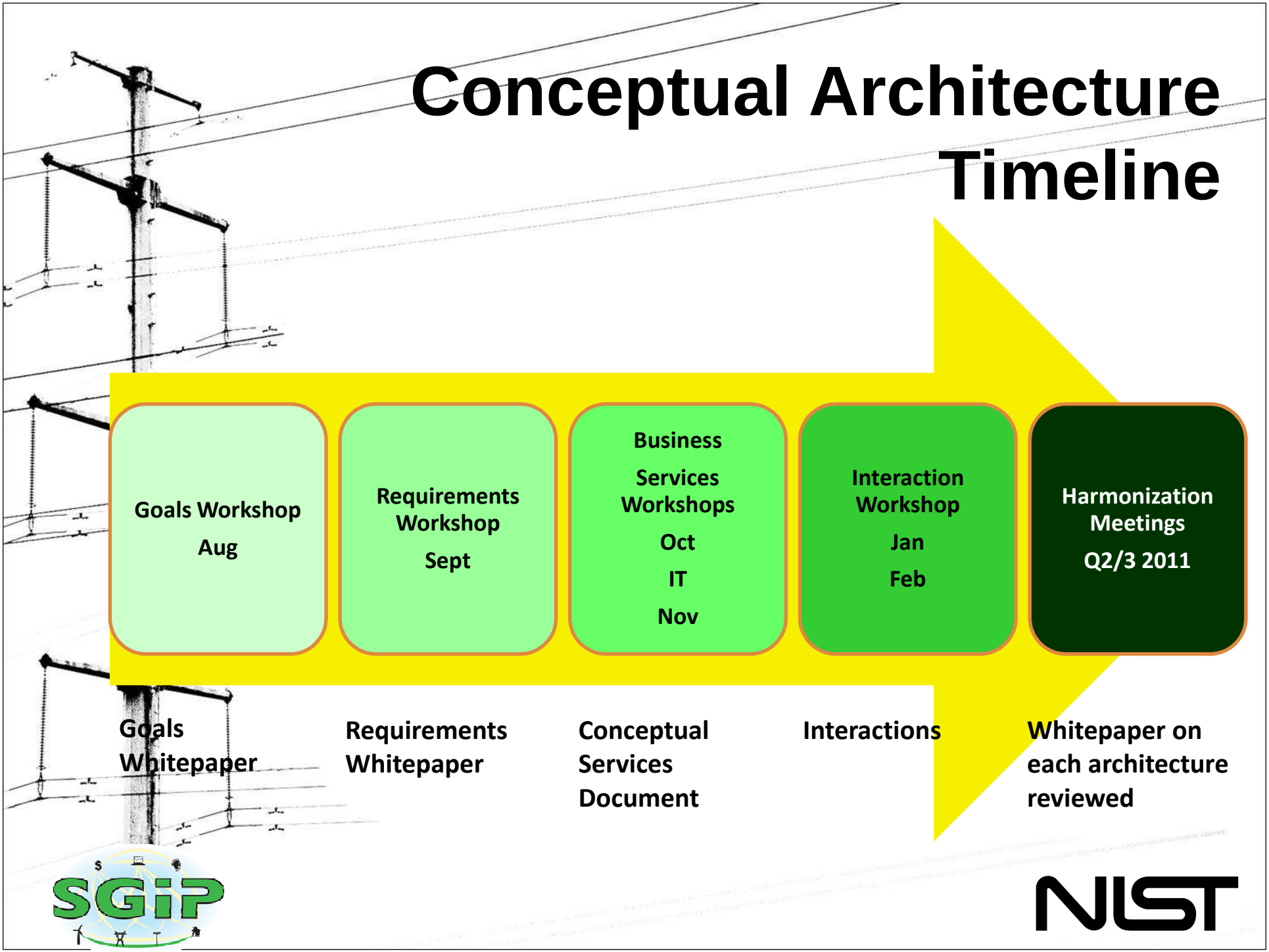
Conceptual Domain Model



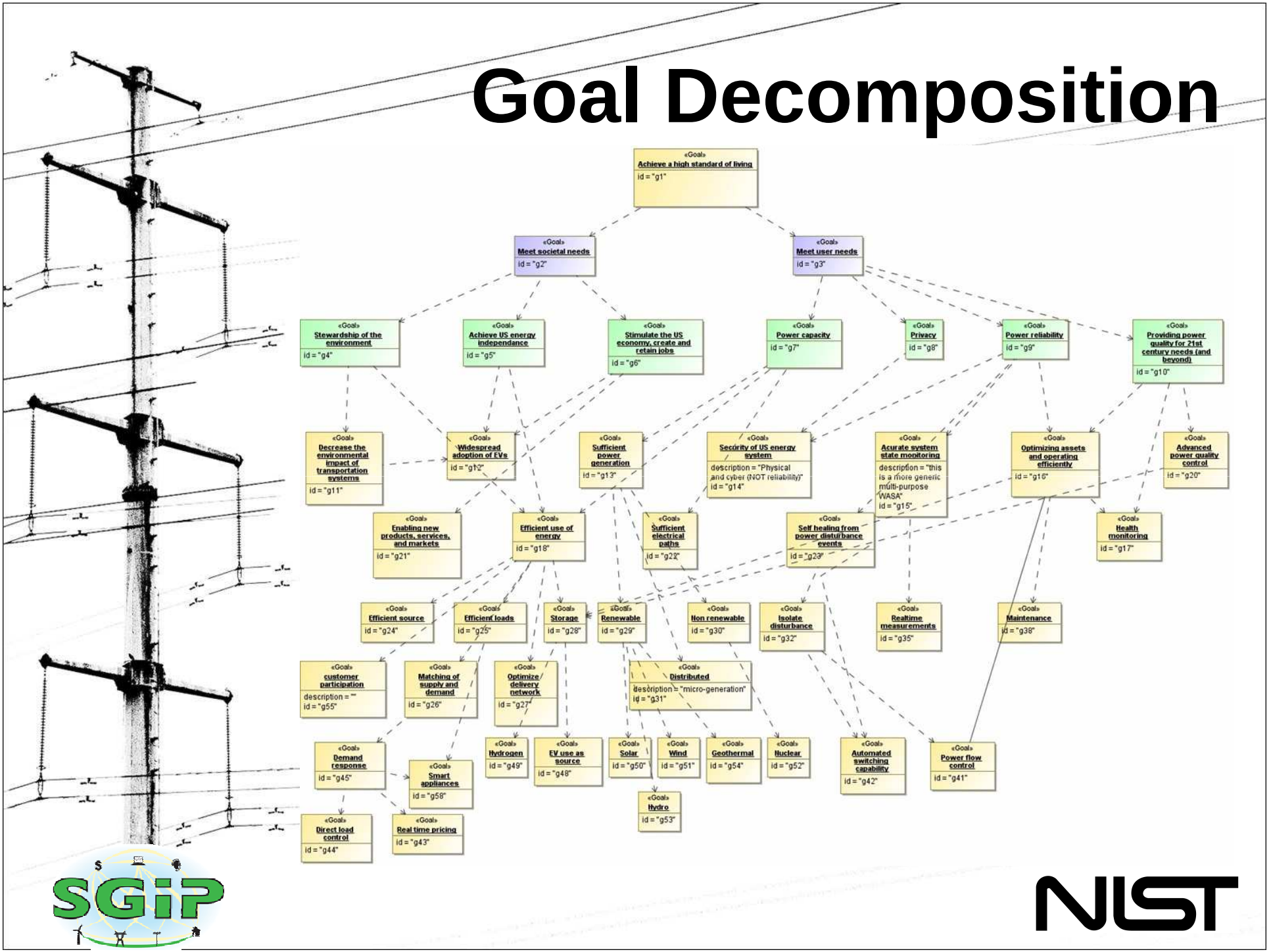
SGiP

NIST

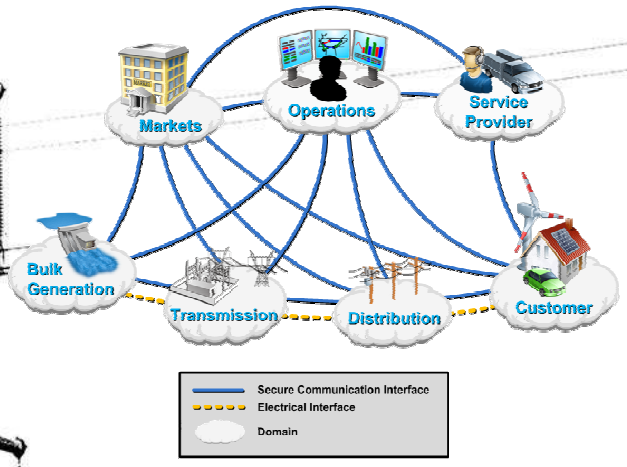
Conceptual Architecture Timeline



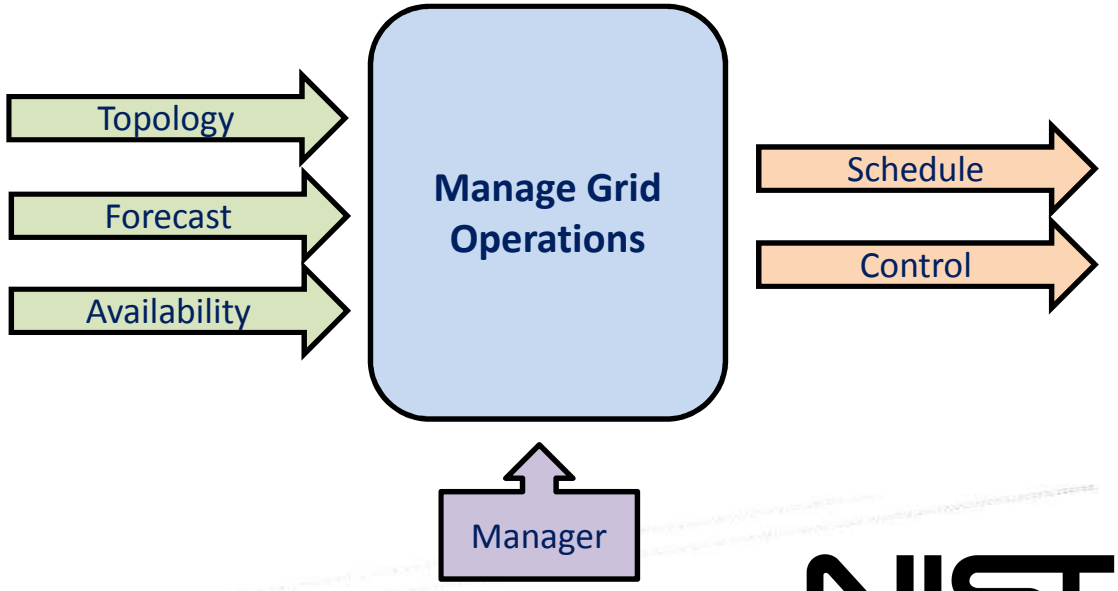
Goal Decomposition



Services

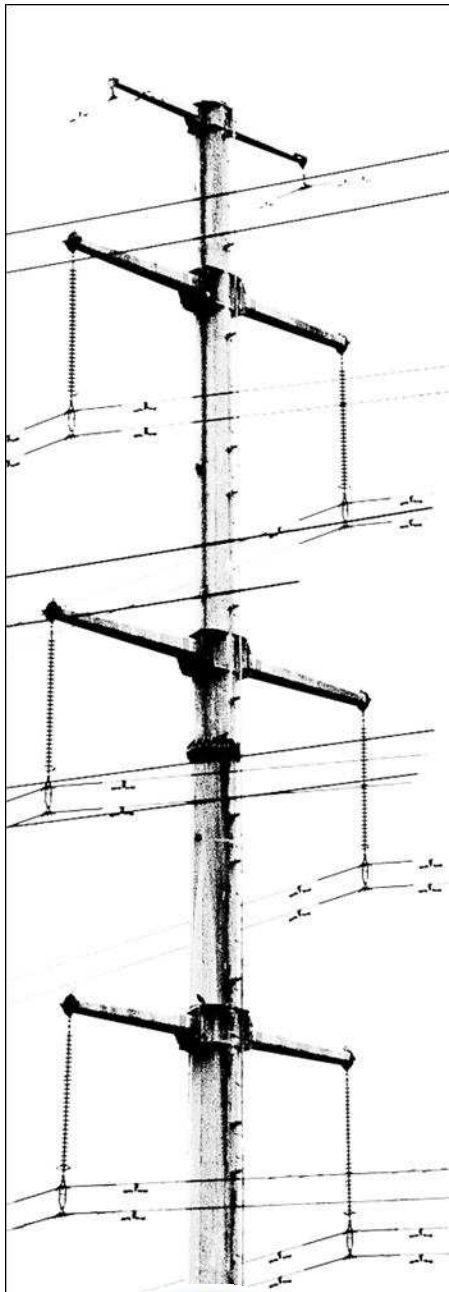


25-60 Services per domain



SGiP

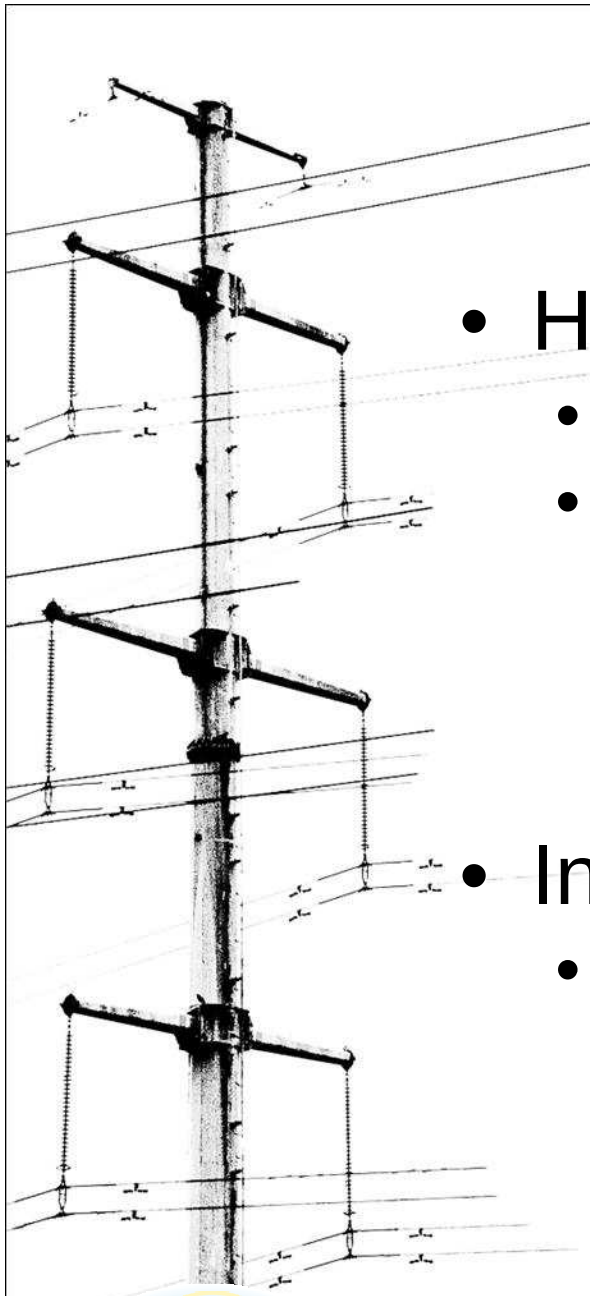
NIST



Initial Feedback

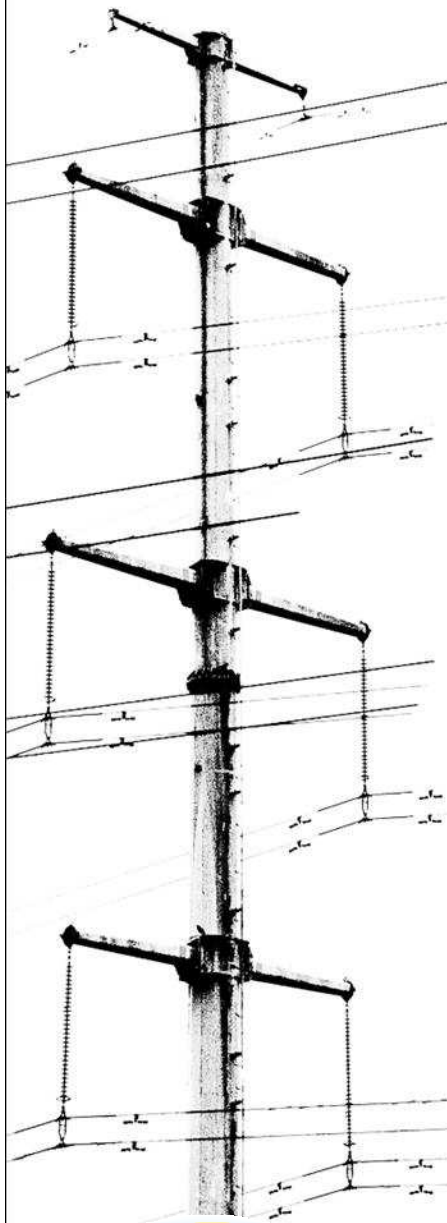
- Market Domain
  - New use cases
- Customer Domain
  - Customer
- Service Provider Domain
  - All areas

- Overall business management
- Many incomplete use cases



Next Steps

- Harmonize
  - Publish a strawman for wider inputs
  - Meet with other organizations developing architecture models to align
    - ITU, IETF, Zigbee expressed interested
- Interoperability
  - Create a set of conceptual information services that run between the domains and the business services to describe the requirements for interoperability



Further Information

- SGIP Twiki
  http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/SGIP

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- Eric Simmon
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