The Smart Grid by Siemens.

Solutions to better manage energy system change.

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Energy systems worldwide are changing...
Key drivers for new solutions

- Distribution Losses: 22%
- Non-technical Losses: 20%
- Distribution Losses: 18%
- Non-technical Losses: 5%
- Distribution Losses: 21%
- Non-technical Losses: 10%
- Distribution Losses: 12%
- Non-technical Losses: 3%
The European energy infrastructure faces fundamental changes

Challenges

Large scale extension of renewable and decentralized generation

Capacity enhancement and modernization of generation and grid infrastructures

Smart Meter roll out

Contain energy prices to remain competitive
Changing energy system requires new solutions

Challenges in changing energy system:
- Renewable and distributed generation
- Limited generation and grid capacity
- Aging and/or weak infrastructure
- Cost and emissions of energy supply
- Revenue losses, e.g. non-technical losses

Smart Grid offers solutions:
- Balancing generation & demand, new business models
- Load management & peak avoidance
- Reliability through automatic outage prevention and restoration
- Efficient generation, transmission, distribution & consumption
- Full transparency on distribution level and automated loss prevention

Alert!

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Siemens Smart Grid offers an end-to-end portfolio designed to provide constant energy in a time of constant change
Smart Grid: Key enabler of the future energy infrastructure
Automated distribution grids assure overall system stability

- Transparency on distribution level enables stability also at TSO level
- Decentral automation supports efficient renewable integration
- Additional data enable IT based system optimization
Smart Metering will add value beyond automated billing

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**Meter Data** enable limitless applications through MDM systems

**MDM** enables use of meter data to stabilize and manage the grid

**MDM** drives customer engagement and affiliation
Demand Response for increased stability and additional value add

- Prevent critical peak load situations from escalating
- Reduce need for base load capacity extension
- Establish new business models for utilities through Demand Response programs
Virtual Power Plants help getting a grip on decentralized generation

- System stabilization through forecast-based load balancing
- Inclusion of smaller units in economically optimized fleet management
- Enhanced business cases for small decentralized generation e.g. participation in reserve markets or energy exchange
Business analytics is key to optimal system management

Operational and enterprise IT integrate

Business analytics is the key to ultimate optimization of utility business

Energy IT will grow with a multitude of use cases
Key requirements to safeguard innovative infrastructure development

- Security of investments in Grid extension and modernization
- Permissive Smart Market schemes
- Legal framework for smart metering and MDM
Successfully implemented – today.