

Smart networks

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The electricity industry is poised to make the transformation from a centralised, producer-controlled network to one that is less centralised and more consumer-interactive. The move to a smarter network promises to change the industry's business model and its relationship with all stakeholders, involving and affecting utilities, regulators, energy service providers, technology and automation vendors and all consumers of electric power.

The key drivers for this change are evident—the need to respond to climate change through the reduction of carbon emissions, and the need to maintain and enhance energy security. The involvement of energy users—consumers—is critical in responding to both drivers.

Delivery of a smart network involves a merging of the existing electricity network infrastructure—upgraded with sensing, monitoring and advanced management devices—with a secure, robust and reliable communications infrastructure, supported by relevant information technologies, resulting in two-way exchanges of energy and communication.

In its efforts to ensure this transformation and the continued delivery of reliable, affordable and clean energy, industry has developed the following vision for the sector—the smart network:

An energy network that promotes diversity, efficiency and flexibility in the transportation of energy which will underpin the secure, affordable, and environmentally friendly supply and use of energy in a carbon constrained world.

Numerous definitions exist as to what constitutes a smart network. However, at the highest level there is a stark comparison between:

1. the electricity networks of today—*transporting energy from major generation sources using mostly non-renewable fuels, to consumers who have limited knowledge of their consumption, where outages affecting customers are largely unknown until the customer alerts the network operator, and*
2. a future smart network—*serving as a dynamic network for two-way energy flows; linking widely dispersed micro-level renewable energy sources at the customer level and large-scale energy sources; providing more dynamic information to customers; facilitating greater customer choice about energy source and level of consumption; and providing real-time information on the performance of the network and optimising the network operations.*

The smart network has five key objectives, to:

1. change the relationship with customers, transforming their role from uninformed and non-participative to informed, active and involved, stimulating demand-side response
2. accommodate connection of widely distributed, renewable energy sources across the network and in particular at customer premises, providing an 'energy clearing house' function
3. facilitate market interactions, providing customers access to products and services with choice, based on price and environmental concerns
4. accommodate new energy storage technologies, enabling customers to choose the source of their energy and optimise the efficiency of their use of energy, and
5. continue to improve the performance of the network by:
 - using greatly enhanced data gathering capabilities
 - detecting and responding to problems automatically
 - strengthening interconnections, and
 - optimising replacement investment.

Delivery of these objectives will contribute significantly to the Australian Government's objectives of reducing greenhouse gas emissions and enhancing energy security.

More information about ENA's smart network policy can be downloaded from www.ena.asn.au.

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