

# 2.1.4 ICT in Power Sector

## Smart Grids

The centralised energy distribution networks used today are usually huge and rather inefficient grids because they lose power in transmission and thus necessitate excessive generating facilities to react to unexpected surges in energy use and only allow for one-way communication from the supplier to customer. Abundant power is wasted through such operations, as can be seen from the 24% of global emissions the Power Sector is responsible for in 2002.

A Smart Grid is a set of software and hardware tools that allow generators to route power with greater efficiency. This would reduce the requirement for excess capacity and also allows for a two-way communication between the supplier and customer. The smart grid would enable providers to have a real time exchange of information with their customers on the amount of energy demanded. Eventually, smart grids would improve efficiency, energy monitoring and data capture across the power generation and Transmission and Distribution network. It is estimated that carbon emissions could be scaled down by 2.03 GtCO<sub>2</sub>e by 2020 in this way.

How ICT can be Applied:

The range of technologies that constitute a smart grid comes under ICT.

### Monitoring

1. Better information for consumers and producers of power
2. Remote monitoring and measurement
3. Improved energy accounting
4. Improved billing services

Technologies and services:

- Sensors for remote measuring, chips and controllers for monitoring
- Smart meters (advanced metering infrastructure (AMI) or automatic meter reading (AMR))
- Energy accounting software
- Smart billing software - IP-based billing or prepaid metering

### Management

1. Better planning and forecasting
2. Improved asset management
3. Improved network design
4. Remote grid management
5. Preventive maintenance
6. DSM

Technologies and services:

- Grid management systems (e.g. supervisory control and data acquisition (SCADA) and output management system (OMS))
- Asset inventory and network design systems (e.g. GIS tools)
- Load analysis and automated dispatch software
- Workflow management systems for the grid
- Performance contracting applications
- Demand response software that allows automated load maintenance

### Navigation Pane

1.	<b>Climate Change</b>
1.1	Definition
1.2	Causes
	1.2.1 Natural Factors
	1.2.2 Human Factors
1.3	Impacts of Climate Change
2.	<b>ICT as a Solution to Climate Change</b>

2.1	Achieving a Green Business through ICT 2.1.1 ICT in Manufacturing Sector 2.1.2 ICT in Transport Sector 2.1.3 ICT in Building Sector 2.1.4 ICT in Power Sector 2.1.5 Case Studies
2.2	Role of the Internet in Promoting Green Awareness
2.3	2.2.1 Government Websites 2.2.2 Other Internet Mediums Other Spinoffs from the Advancement in ICT 2.3.1 Change in Working Styles 2.3.2 Change in Lifestyles 2.3.3 Change in Teaching and Learning Styles
<b>3.</b>	<b>Limitations of ICT in Fighting Climate Change</b>
3.1	Freedom of Expression
3.2	ICT's Two-fold Role
3.3	Inability of ICT to stand as an Independent Solution
<b>4.</b>	<b>Ongoing Research and Development of ICT in fighting Climate Change</b>
4.1	Symposium
4.2	Conference Talk
4.3	Progress
<b>5.</b>	<b>Quotes on ICT and Climate Change</b>
5.1	Quotes
<b>6.</b>	<b>References</b>