ITU-CITET Regional Training Workshop on ICT and Climate Change Mitigation and Adaptation in Arab Region

Tunis, Tunisia 12-13 July 2017

Session 6: Green ICT Strategies

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Session Objectives

- This session introduces Green ICT Strategies and Mitigation in particular.
- It provides an understanding of the key technologies, applications, services and standards that will help mitigate against climate change.
- Sectors such as Smart Energy, Smart Buildings, Smart Agriculture and Smart Logistics are covered and their contribution to Mitigation identified.


Session Topics

- How a range of green ICT technologies can be used to reduce GHG emissions.
- What are the potential GHG savings from the introduction of green ICT technologies?
- Barriers to the introduction of green ICT technologies.
- How policy makers and regulators can promote and enable introduction of green technologies.
- How Standards can enable the deployment of green technologies.

Warm-up Exercise with Flip Chart/Power Point (2 minutes)

Which green technologies can you think of?

- How would these save energy and GHG emissions?

Your Answers

- 1)
- 2)
- 3)

To start:
What is a Green ICT Strategy?

Green ICT Strategy

- A Green ICT strategy can be designed to achieve economic, social and environmental goal in an interrelated and coherent fashion without seeing them as trade-off.
- For example a green building is energy efficient, saves cost and is comfortable to occupants and is a good example of achieving the triple bottom line goals of sustainability.
- The objectives of Green ICT strategies include:
  - Pollution prevention: minimizing or preventing pollution from ICT.
  - Product stewardship: considering environmental impacts throughout the ICT lifecycle including raw-material sourcing, product design, and development processes (LCA)
  - Clean technology: developing and deploying ICT solutions with a view to reducing the level of environmental impact along a product‘s lifecycle from design to consumption (Greening by ICT)
  - Sustainability vision: using ICT in envisioning a sustainable development.

Egyptian Green ICT Strategy

- E-waste sustainable Management Actions
  - Conduct E-waste assessment report covering the whole of Cairo.
  - Implement a program for raising the community awareness about E-waste threats and opportunities.
  - Support the participation of IT companies and institutions to start the implementation of pilot projects for e-Waste Management.
  - Participate in proposing legislation and laws to support the rational management of electronic waste.

Source https://www.itu.int/dms_pub/itu-t/oth/06/0F/T060F00060150001PDFE.pdf

Egyptian Green ICT Strategy Achievements

World Bank

- TOR of Diagnostic analysis on E-waste management practices on Egypt.
- Road Map for the implementation of E-waste Pilot Project , including: Note on economic incentives, Collection Strategy, Guidelines for the involvement of private sector and NGOs in e-waste management
- concept note on" available training courses on E-waste Management and Green ICT Procurement

Consortium of Best of 2 Worlds approach

- Hosting the 1st and 2nd stakeholders meetings' of the Best of 2 Words approach.

Ministry of Industry and Foreign Trade

- In cooperation with the ministry of Environment, and ministry of Industry and foreign trade", a study has been conducted on " assessing the ministerial decree No 384 for year 2012 on the prohibition of importing used computers and its peripheral which issued by ministry of Industry and foreign trade"

- Opening the ITG –E-waste recycling factory (the 1st in Egypt and middle East);
- Launching the first campaign of collection from home (Recyclobekia & Resala);
- Supporting Spear Ink company. The first factory in Egypt in the field of re manufacturing cartridges and producing ink and toner refilling machines

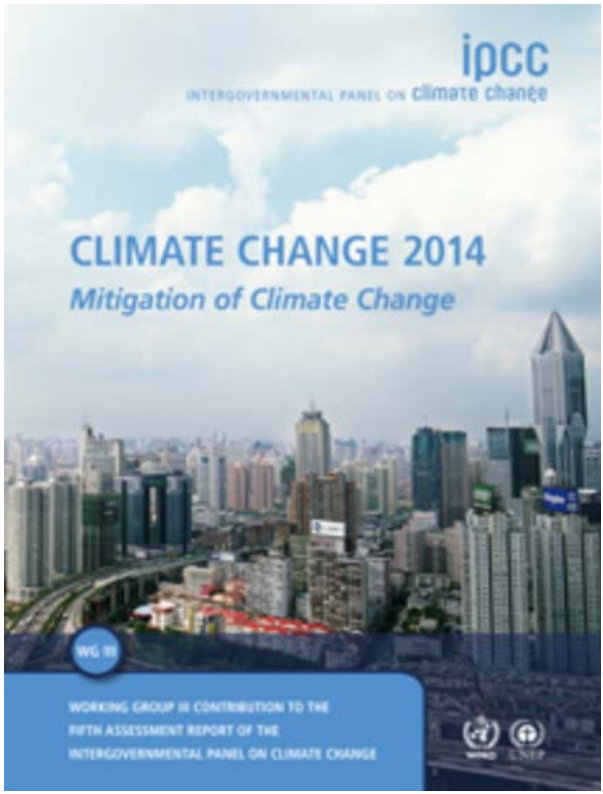
RecycloBekia
Recycling Army

Source: https://www.epa.gov/sites/production/files/2014-08/documents/egypt-_green_ict.pdf

Next:
The importance of Mitigation in Green ICT Strategy

The importance of Mitigation

- Without additional efforts to reduce GHG emissions beyond those in place today, emissions growth is expected to persist driven by growth in global population and economic activities.
- Mitigation scenarios reaching about 450 ppm CO_2e in 2100 typically involve overshoot of atmospheric concentrations, as do many scenarios reaching about 500 ppm to about 550 ppm CO_2e in 2100.



www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf

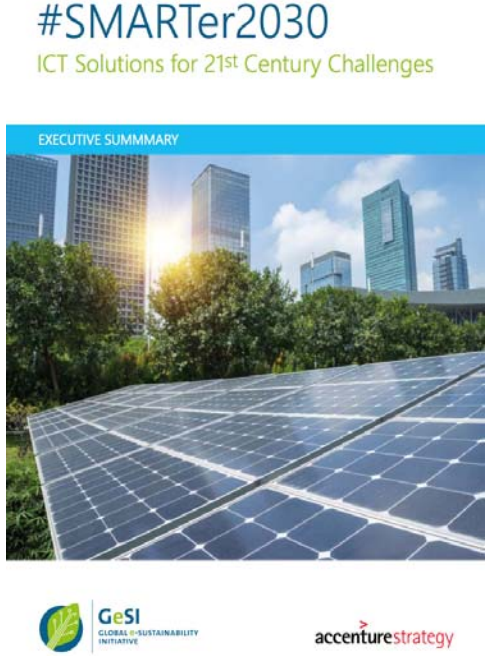
Mitigation: Emission reductions possible in other sectors using ICTs

Categories	Effects
Consumption of materials	By reducing materials consumption (dematerialization), the environmental load related to goods production and disposal as well as waste generation can be reduced.
Power / energy consumption	By enhancing the efficiency of power and energy use to reduce consumption, the environmental load related to power generation, power transmission, etc. can be reduced.
Movement of people	By reducing the movement of people, the environmental load required for transportation can be reduced.
Movement of materials	By reducing the movement of materials, the environmental load required for transportation can be reduced.
Improved efficiency of office space	By using office space efficiently, power consumption for lighting, air conditioning, etc. can be reduced, thus reducing environmental load.
Storage of goods	By reducing storage space of goods, power consumption for lighting, air conditioning, etc. can be reduced, thus reducing environmental load.
Improved work efficiency	By enhancing work efficiency, the environmental load can be reduced.
Waste	By reducing waste emissions, the environmental load required for environmental preservation as well as for waste disposal can be reduced.

Source: ITU-T Recommendation L.1400 "Overview and general principles of methodologies for assessing the environmental impact of ICT" www.itu.int/rec/T-REC-L.1400

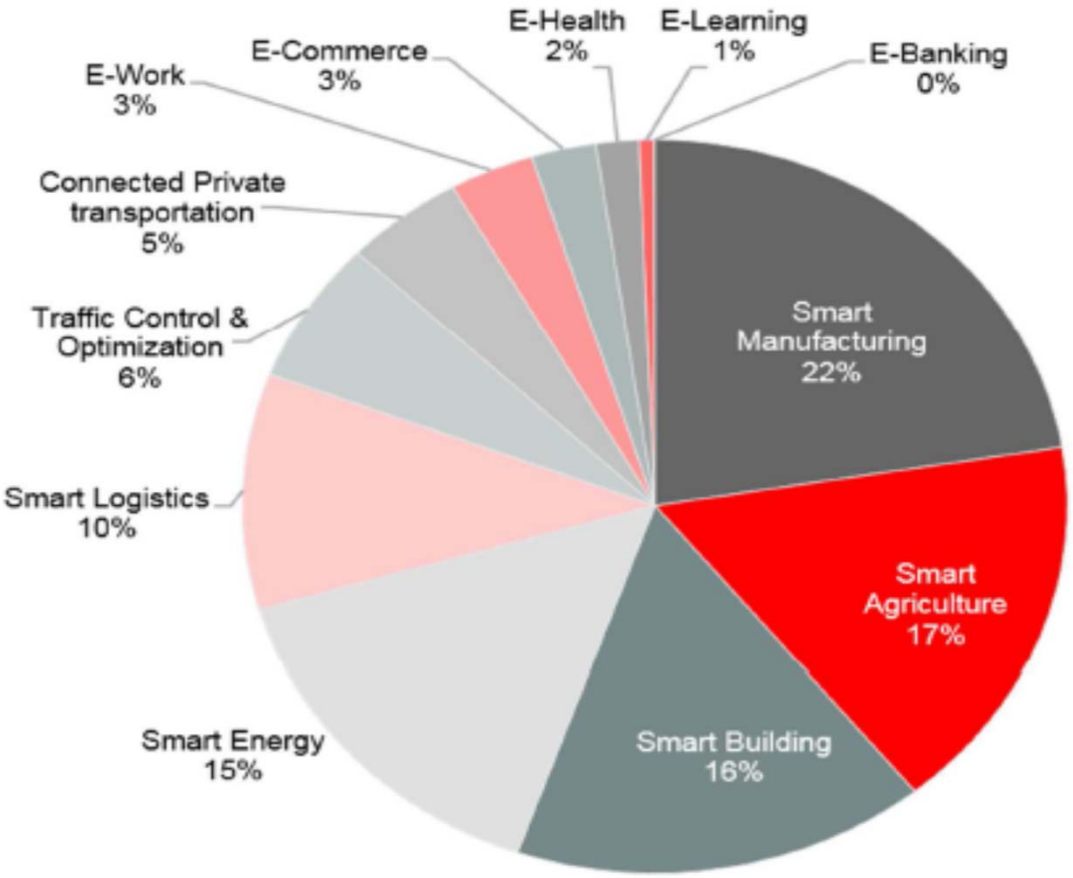
GeSI SMARTer 2030 claims…

- ICT can enable a 20% reduction of global CO_2e emissions by 2030, holding emissions at 2015 levels.
- ICT emissions as a percentage of global emissions will decrease to 1.97% of global emissions by 2030, compared to 2.3% in 2020.
- ICT could generate over $11 trillion in economic benefits per year by 2030.



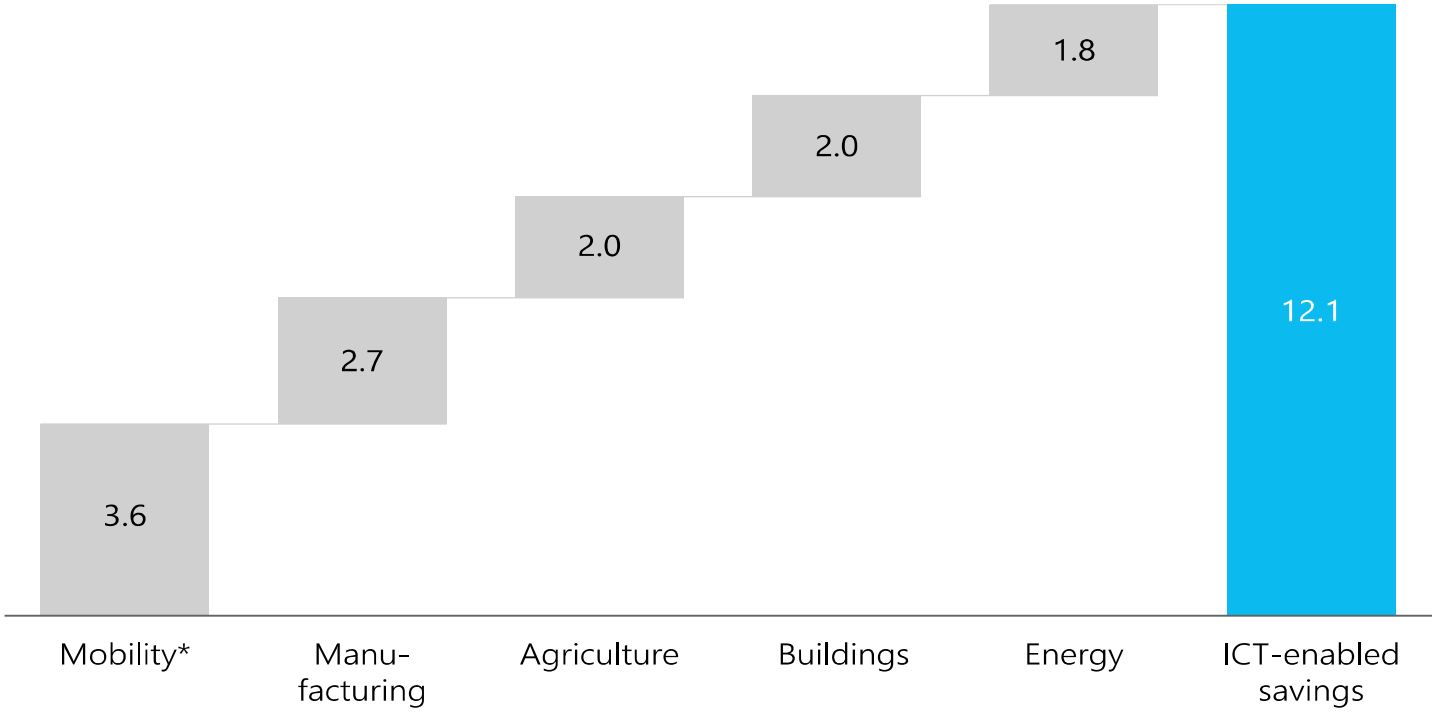
Source: GeSI: SMARTer2030 ICT Solutions for 21st Century Challenges, 2015.

ICT CO_2e abatement potential (2030)



Source: GeSI (2015,pp 18)

CO_2e abatement potential by sector (2030)



Source: GeSI: SMARTer2030 ICT Solutions for 21st Century Challenges, 2015.

Korea's Green ICT Strategy

- Smart grids
- Telepresence
- E-commerce
- E-civil service
- E-logistics
- Real-time navigation
- E-government
- Smart motors
- Home energy management systems
- Digital contents
- Smart work
- E-learning
- Bus information systems
- E-health care

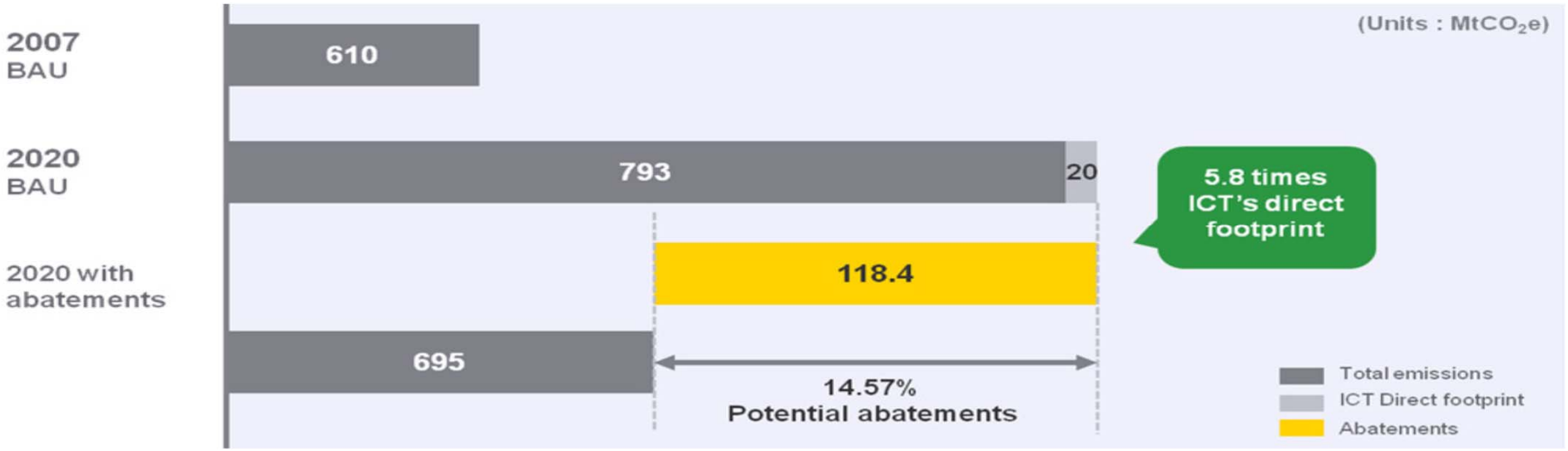
ITU Report: "The case of Korea - The quantification of GHG reduction effects achieved by ICTs", 2013 – www.itu.int/pub/T-TUT-ICT-2013-08

Potential GHG emission reductions arising from the introduction of 14 ICT services

ICT services	Year 2011	Year 2020
	GHG abatement (Units: million tCO_2e)	GHG abatement (Units: million tCO_2e)
1. Smart grid	1.98	68.70
2. Telepresence	0.86	11.03
3. E-commerce	1.09	7.93
4. E-civil service	0.47	6.11
5. E-logistics	1.34	4.79
6. Real-time navigation	0.59	3.57
7. E-government	0.15	3.48
8. Home energy management system	0.76	2.96
9. Smart motor (Industrial)	1.61	2.89
10. Digital contents	0.52	2.05
11. Smart work	0.17	1.89
12. E-learning	0.69	1.61
13. Bus information system	0.25	1.40
14. E-health care	0.02	0.04
Total	**10.3**	**118.4**

www.itu.int/pub/T-TUT-ICT-2013-08

Potential GHG emission reductions compared to Business as Usual (BAU)

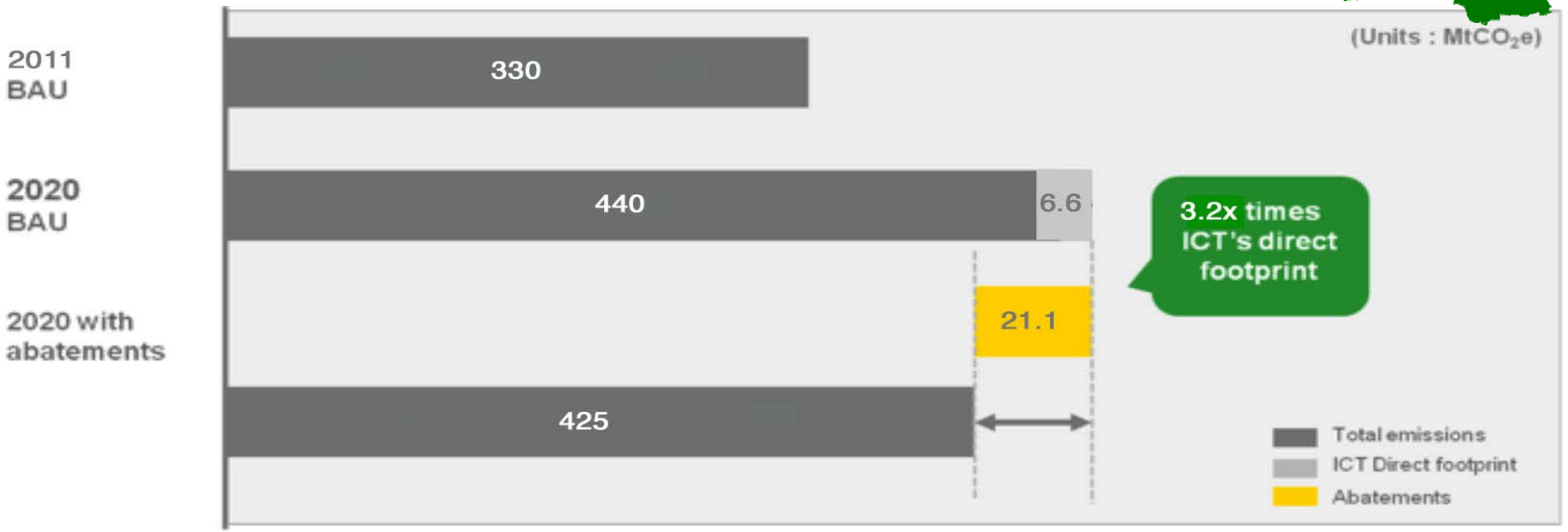


www.itu.int/pub/T-TUT-ICT-2013-08

Potential GHG emission reductions from the introduction of ICT services in Pakistan

Smart Meters	3.87 $MtCO_2e$
Smart Grids	4.36 $MtCO_2e$
RTN	0.86 $MtCO_2e$
e-logistics	0.36 $MtCO_2e$
Telepresence	0.01 $MtCO_2e$
Bus Information Systems	5.46 $MtCO_2e$
e-government	0.59 $MtCO_2e$
e-commerce	5.15 $MtCO_2e$
Home Energy Management Systems	0.41 $MtCO_2e$
Total	21.05 $MtCO_2e$

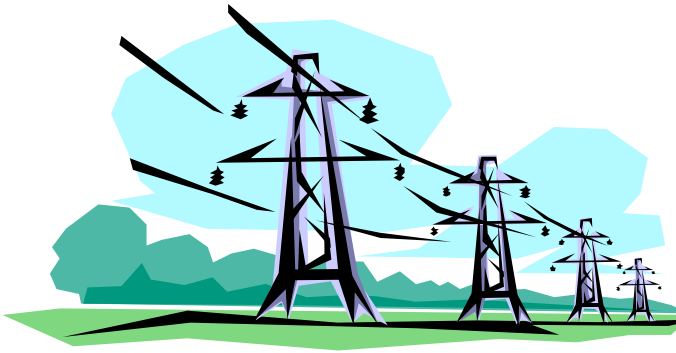
Potential GHG emissions reductions compared to Business as Usual (BAU) in Pakistan



Next:
Green ICT Technologies

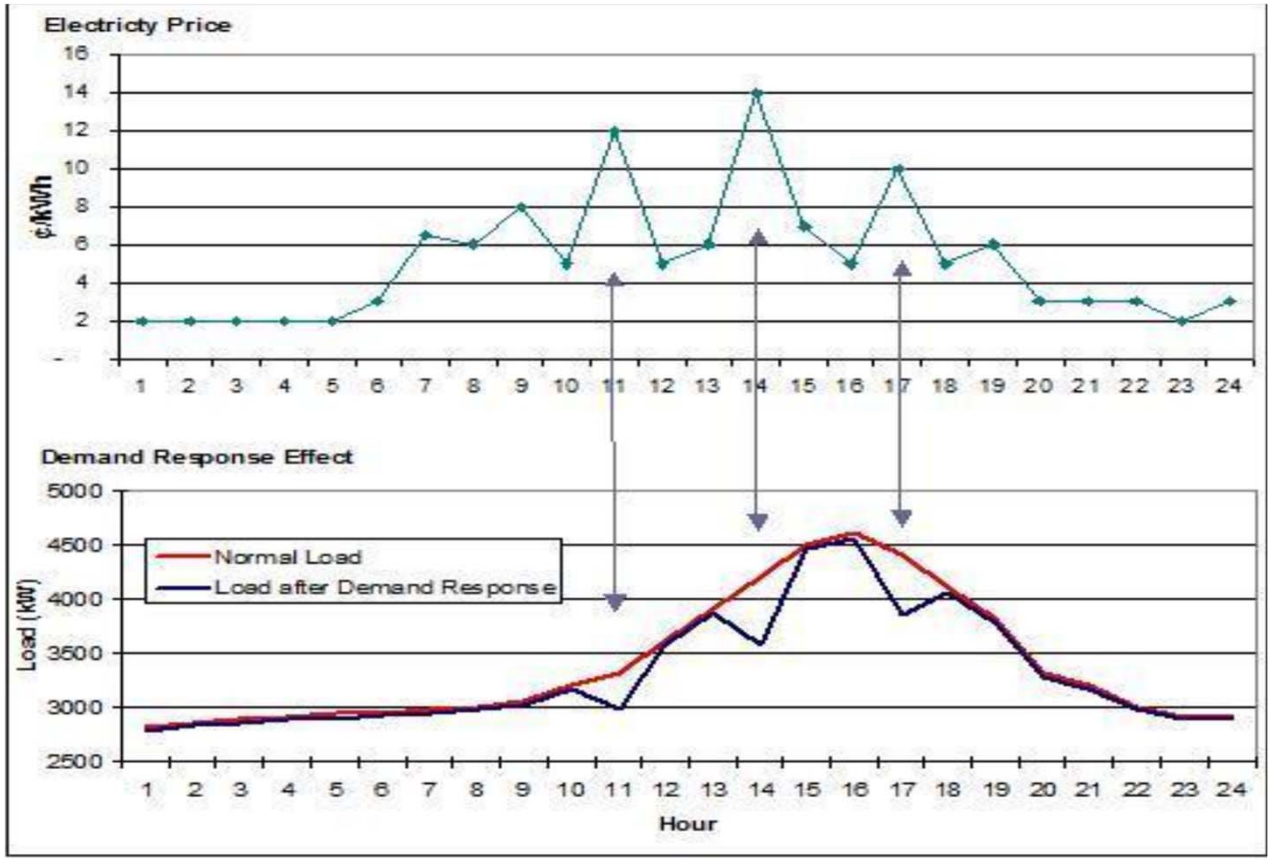
Smart Energy

- A ‘smart grid’ is a set of software and hardware tools that enable generators to route power more efficiently, reducing the need for excess capacity and allowing two-way, real time information exchange with their customers for real time demand side management (DSM).
- Demand control (electricity) by load shifting via smart meters and appliances
  - Reduces peak demand saving hot standby power stations
  - E.g. temporary turn off, for refrigerator, dishwasher etc. (future electric vehicle charging)
  - Requires communication to meters and appliances

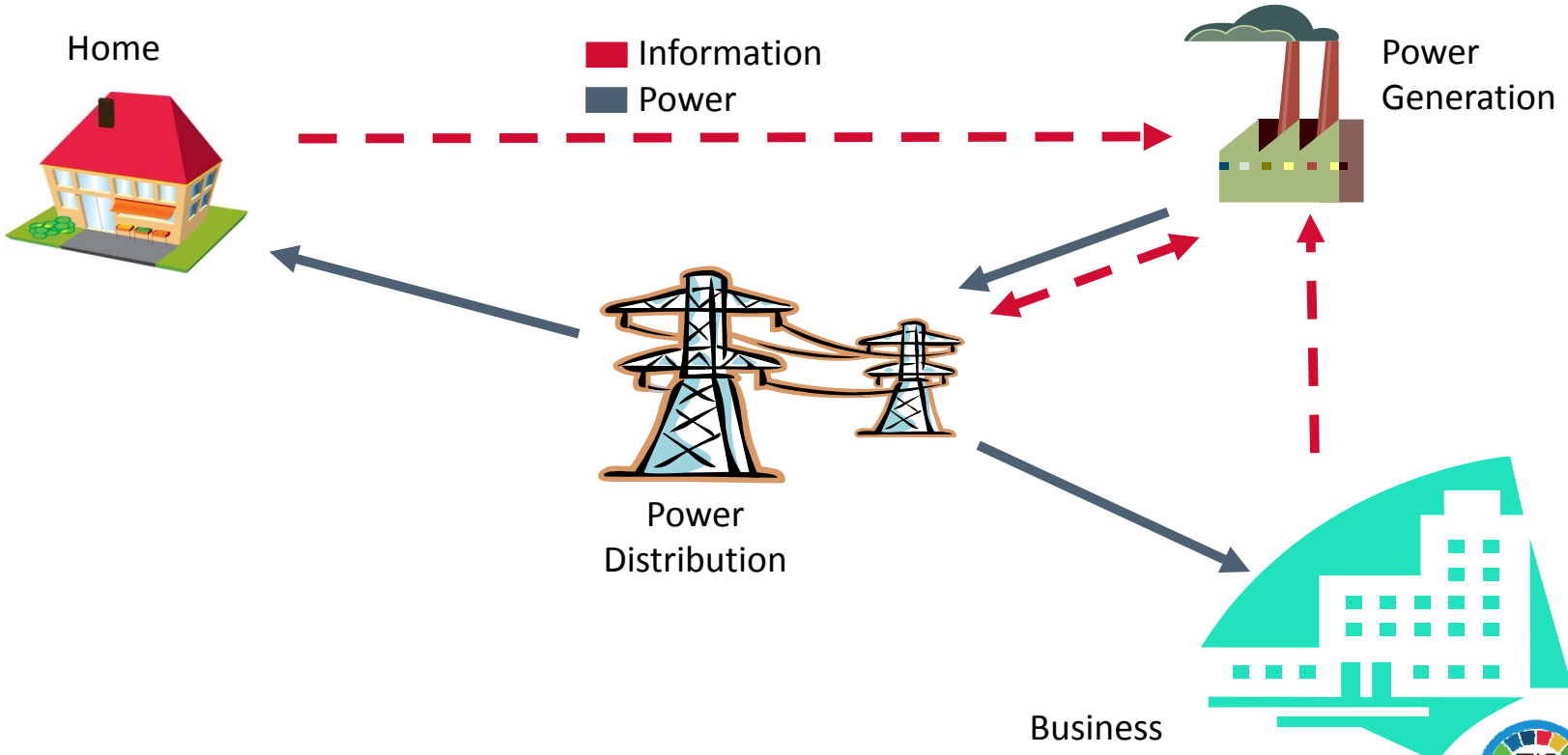


Smart Grid Vision and Roadmap for India:
http://indiasmartgrid.org/en/resource-center/Reports/Smart%20Grid%20Vision%20and%20Roadmap%20for%20India.pdf

Smart Energy: Demand Response



A Simplified View of “Smart Grid”: Today One-way Flow of Power and Information



Source: ITU Report on Boosting Energy Efficiency through Smart Grids

The Simplified "Smart Grid": Tomorrow Full Bi-directional Flow of Energy & Information