



Presentation to ITU-APT Foundation of India - 31 May 2011

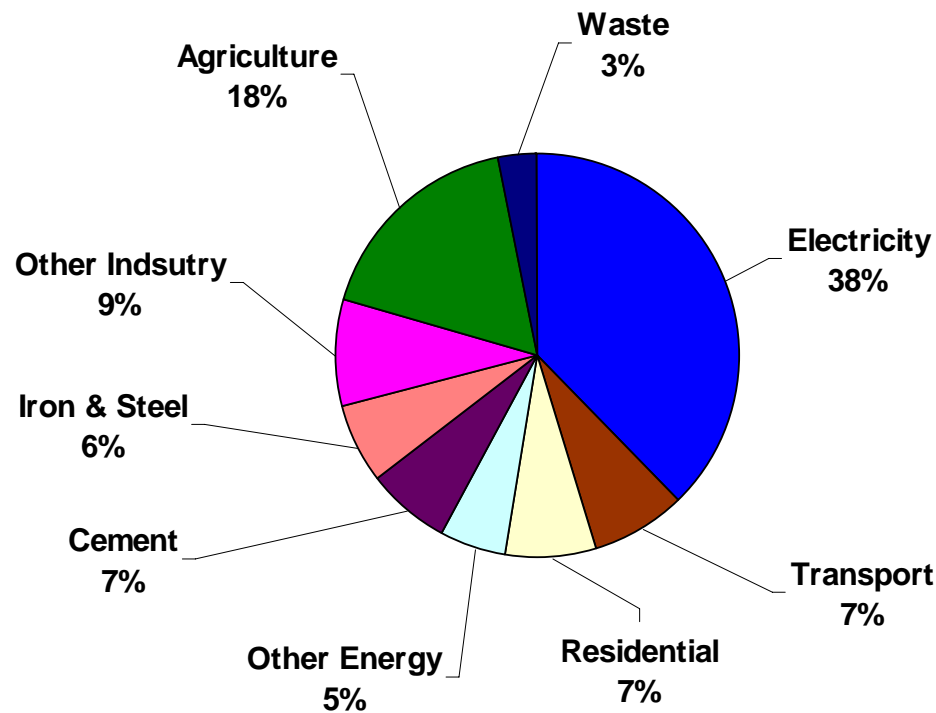
Mobile Energy Efficiency

**TELECOM SECTOR IN INDIA
CONTRIBUTES TO
NEGLECTIBLE AMOUNT OF GHG**



Sector-Wise – CO2 (eq)– Emissions – in India

Sector Wise - CO2 (eq) - emmissions - India 2007



Agriculture, Electricity, Transport and Cement account for 70% of CO2 emissions in India.

Share of Telecom sector in the overall CO2 emissions is negligible.

Source: INCCA – India GHG Emission, 2007 - MOEF



Telecom Myths Debunked (1/2)

- **MYTH** -Telecom sector exploiting subsidized diesel- because of its diesel consumption

- **FACTS**
 - Limited availability of grid power
 - Purchase, transportation and pilferage of diesel are 33% of OPEX
 - Minimum roll out clause
 - Need to maintain QoS and network up-time
 - Diesel generator most efficient among available options
 - When many of these towers were built, solar energy was not developed enough for commercial use. The choice of diesel generators was the best alternative, not only because there were no other types of generators
 - To minimize environmental impact, all operators first use battery power and when these run out, switch to diesel generators



Telecom Myths Debunked (2/2)

■ FACTS

- The cellular industry was one of the first to start widely using solar panels and wind energy applications and continues to do so
- The Industry has been at the forefront of encouraging the government to provide grid power to our cell sites and installations on a priority basis
- However, this has not happened. Neither has the government initiated any alternate energy sources, like solar farms, wind farms, etc. to augment generation of its grid power
- As such, the industry cannot be blamed for its continued dependency on diesel, anymore than the railways can be blamed for NOT switching to electricity

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SIGNIFICANT POSITIVE EXTERNALITIES OF ICT



The enabling effect of ICT

- The ICT sector has a powerful role to play in tackling climate change by enabling other sectors, such as transport, buildings, power and industry, to become more efficient.
- ICT could reduce global carbon emissions by 7.8 GtCO₂e by 2020 (from an assumed total of 51.9 GtCO₂e).
- The five major opportunities for reducing emissions are
 - dematerialisation,
 - smart motor systems,
 - smart logistics,
 - smart buildings and
 - smart grids



The enabling effect of ICT

- **Dematerialisation** – the substitution of high carbon products and activities with low carbon alternatives e.g. replacing face-to-face meetings with videoconferencing, or paper with e-billing, could play a substantial role in reducing emissions.
 - dematerialisation could be responsible for reducing emissions by 500MtCO₂e, just less than Australia’s total emissions in 2005.
- **Smart Motor systems** –ICT could play a significant role in mitigating global carbon emissions from motor systems and industrial process optimization; reduction of up to 970 MtCO₂e in 2020. .
 - A motor is “smart” when it can be controlled to minimize its power usage through a intelligent motor controller (IMC), ICT’s main role, therefore, will be to monitor energy use and provide data to businesses so they can make energy savings by changing manufacturing systems.
- **Smart logistics** – translate into an efficient transportation system which help in reducing fuel cost
 - ICT can improve the efficiency of logistics operations in a number of ways such as software to improve the design of transport networks, inventory reduction etc.



The enabling effect of ICT

- **Smart Buildings** – These include building management systems (BMS) that run heating and cooling systems according to occupants' needs or software that switches off all PCs and monitors after everyone has gone home.
 - A host of BMSs already exist and as ICT applications become more sophisticated, the range of BMS functions will expand. This sector would emit 11.7 GtCO₂e in 2020 and ICT offers a major opportunity to reduce emissions from this sector by 15% in 2020.
- **Smart Grid** – 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).
 - It improves efficiency, energy monitoring and data capture across the power generation and T&D network.
 - The potential for ICT to reduce carbon emissions through smart grid technology could be substantial; some 2.03 GtCO₂e by 2020



MOBILE ENERGY EFFICIENCY INITIATIVE BY GSMA



Objectives of GSMA's Mobile Energy Efficiency Initiative

- To develop a benchmarking methodology, KPIs and benchmark outputs which allow mobile operators to:
 - compare multiple networks on a like-for-like basis and against standard energy KPIs; and
 - reduce energy consumption, emissions and costs
- To coordinate with industry and regulatory stakeholders so that the benchmarking methodology is adopted as a global standard by the industry

22 MNO participants, accounting for 170 networks. Successful pilot completed with Telefonica, Telenor and China Mobile



Participants in GSMA's MEE initiative



Benefits for operators

1. A detailed analysis of the relative performance of their networks against a large dataset
 - *Energy cost and carbon emissions savings of 20% to 25% of costs are typical for underperforming networks*
2. Suggested high level insights to improve efficiency
3. The opportunity to participate in analysis on an annual basis to map improvements over time and quantify the impacts of cost reduction initiatives
4. Demonstrate a commitment to energy and emissions reduction, which will have a positive impact on regulators, investors, customers and other stakeholders



Methodology

- Unique analytical approach allows MNOs to compare their networks against one another and against their peers on a like-for-like basis
 - Variables outside the operator's control, e.g. population distribution and climatic conditions, are **normalised** for using multi-variable regression techniques

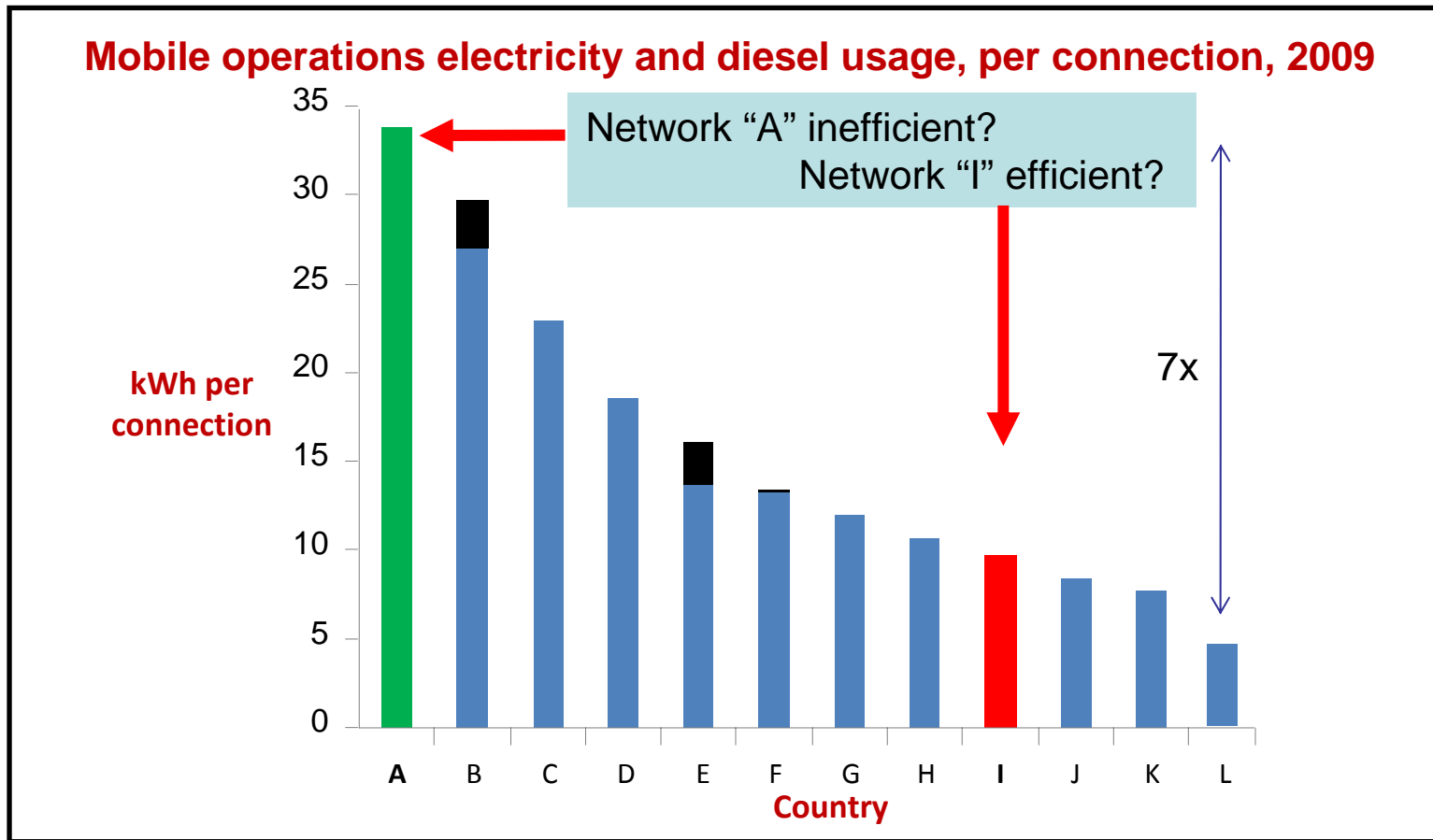
- Key Performance Indicators
 1. Energy consumption per mobile connection
 2. Energy consumption per unit mobile traffic
 3. Energy consumption per cell site
 4. Energy consumption per unit of mobile revenue

- External comparisons are made anonymously



Internal benchmarking, before normalisation

Spread of energy per connection across countries can be high



Key

Electricity usage

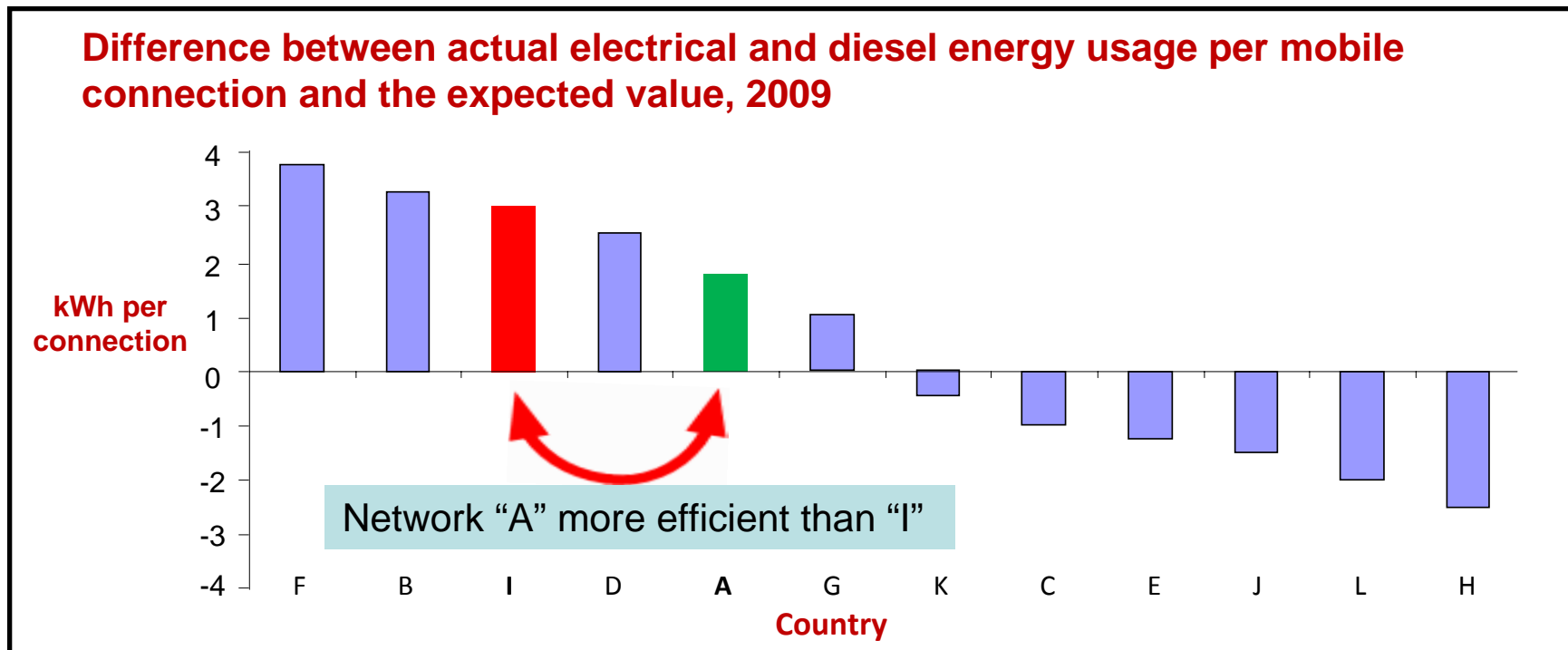
Diesel usage



Mobile Energy Efficiency

Internal benchmarking, after normalisation

Normalisation (against 5 variables) shows a truer picture



Regression variables

Mobile operations diesel & electricity usage per connection regressed against:

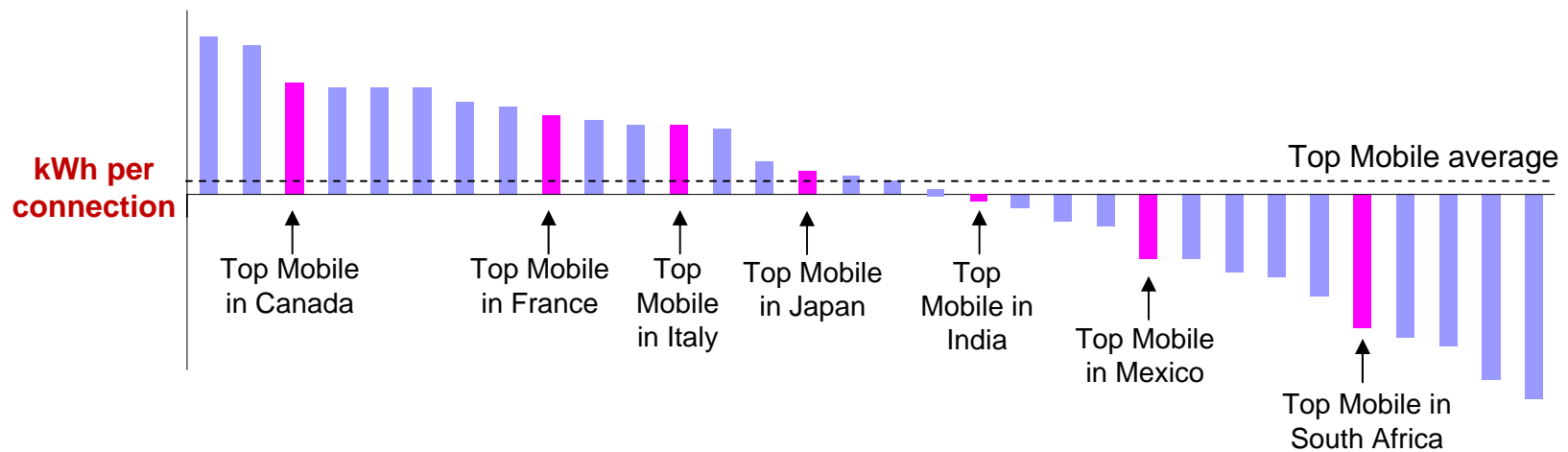
- % 2G connections of all mobile connections
- Geographical area covered by MNO per connection
- % urban population / % population covered by MNO
- Number of cooling degree days (population weighted)
- GDP per capita (adjusted)



Example of external benchmarking

An anonymous comparison against other operators will allow greater insights for energy managers in operator “Top Mobile”

Difference between operators’ actual electrical and diesel energy usage per mobile connection and the expected value, 2009



Key

- Top Mobile International OpCos
- Other Operators

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Next steps for the GSMA MEE programme

- May / June
 - Feedback results to, and debate implications with, participating operators. Results already sent to 13 operator groups
 - Include new participants; refine results
- June / July. Issue final 2009 benchmarking report
- August onwards. Collect data for 2010 and prepare for 2010 report



STEPS INITIATED BY MOBILE SERVICE PROVIDERS IN INDIA



Initiatives taken by Telecom Industry (1/2)

- “Green power” programmes, exploring the use of a wide range of technologies, such as bio-diesel, fuel cells, pico-hydro, wind and photo voltaic panels
 - Aircel has adopted green initiatives designed and implemented by Wipro Eco Energy, the clean energy division of Wipro
 - Vodafone has adopted energy efficient cooling, alternating diesel battery hybrid mode, reducing the diesel consumption
 - Airtel has been rolling out its “Green shelters” concept leading to major savings in energy consumption by its network in India
 - Idea Cellular has deployed solar and bio-fuels on trial basis for their base stations

As a step towards going green, all operators are moving towards paper less billing.



Initiatives taken by Telecom Industry (2/2)

- Equipment vendors, tower companies and network service providers are investing heavily in bringing out “green products”
- Adoption of “Green Products” and “Green Process” :
 - Bharti Infratel Limited had been awarded the “Green Mobile Award” at the 2011 GSMA Annual Global Mobile Awards for Best Green Product for its pioneering P7 Green Towers project initiative that includes seven initiatives which significantly reduces dependency on diesel. These initiatives include Solar DG Hybrid, Variable Speed DCDG, Fuel Cells, DCFCU, IPMS, GenX & Fuel Catalyst.
 - Ericsson has developed the Ericsson tower tube, which uses natural convection cooling, to reduce feeder loss, resulting in a reduction of up to 40 percent in power consumption.
 - Huawei’s has developed single RAN solution based on software-defined radio (SDR) system to truly integrate multiple networks.



Government should provide incentives for GREEN

- The industry believes that the government ought to reduce the present USO levy of 5% of AGR and use this as a subsidy to industry to switch to solar/ alternate energy which require high up-front investments.
- Government to approve not only passive infrastructure sharing but also active infrastructure sharing. This will further reduce the number of new towers required.
- We also encourage the government to formalize and finalize the carbon credits policy so the industry can use this to augment its investments in alternate energy sources.
- Govt should ensure increased spectrum availability as the same will further allow the industry to reduce the number of planned towers.



THANK YOU

