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Telecommunications and climate change: African and European experiences and requirements

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Introduction

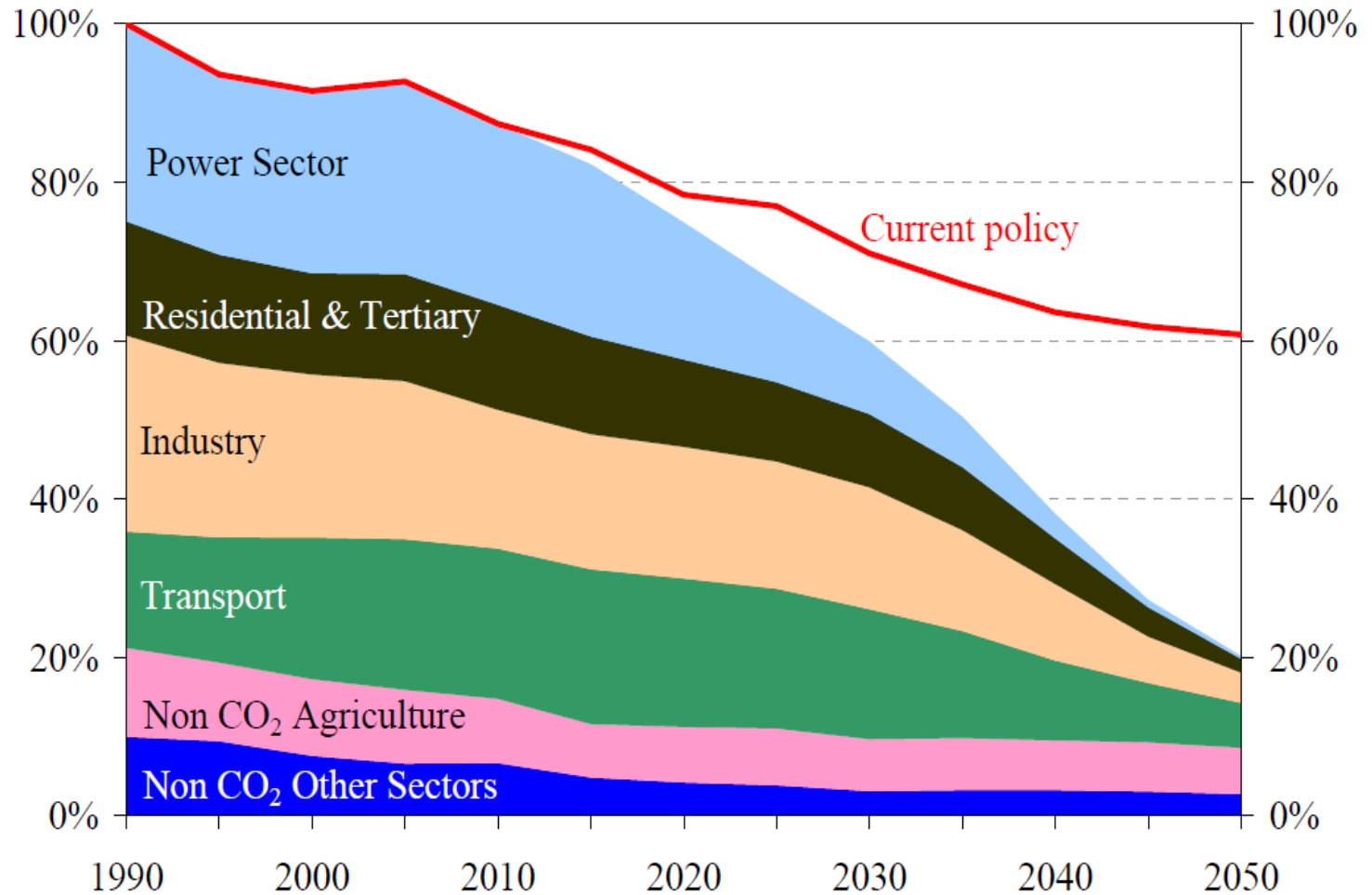
- ▶ Undertakings to reduce global emissions
- ▶ UNFCCC COP meeting:
 - Durban 28 November – 9 December 2011
- ▶ ICTs have significant emissions
- ▶ Diversionary focus on use of ICTs in controlling other sectoral emissions:
 - Smart Grids, Smart Homes, etc.
- ▶ Very high levels of growth of telecoms:
 - Network devices
 - Network access
 - Network traffic
 - Consequently of GHG emissions

Contribution of ICTs to GHGs

- ▶ Gartner Group (2007):
 - ICT sector ~2.5 per cent of global emissions
- ▶ KTH Royal Institute of Technology (2007):
 - ICT sector ~1.3% of global emissions (3.9% of global electricity use),
 - Entertainment & Media (E&M) ~1.7% of global emissions (3.2% of global electricity)
- ▶ Japanese government (2006):
 - ICT sector ~2.2% of national emissions
- ▶ Indian regulator
 - Telecommunications is ~1.0% of national emissions (c.f. 0.7% globally)
- ▶ Australian Computer Society (2010):
 - ICT sector 2.7 per cent of national emissions (> 7% of electricity used)
- ▶ European Union:
 - ICT products and services 7.8% electricity used in 2005
 - Forecast to rise to 10.5% by 2020
- ▶ United Kingdom music industry:
 - 540,000 tonnes CO₂e per annum (~0.1% of UK total emissions), of which:
 - Music recording and publishing 26%
 - Live music performances 74%

Are any of these reliable? Consistent?

EU 80% reduction from 1990 levels



Sources of GHGs in telecoms

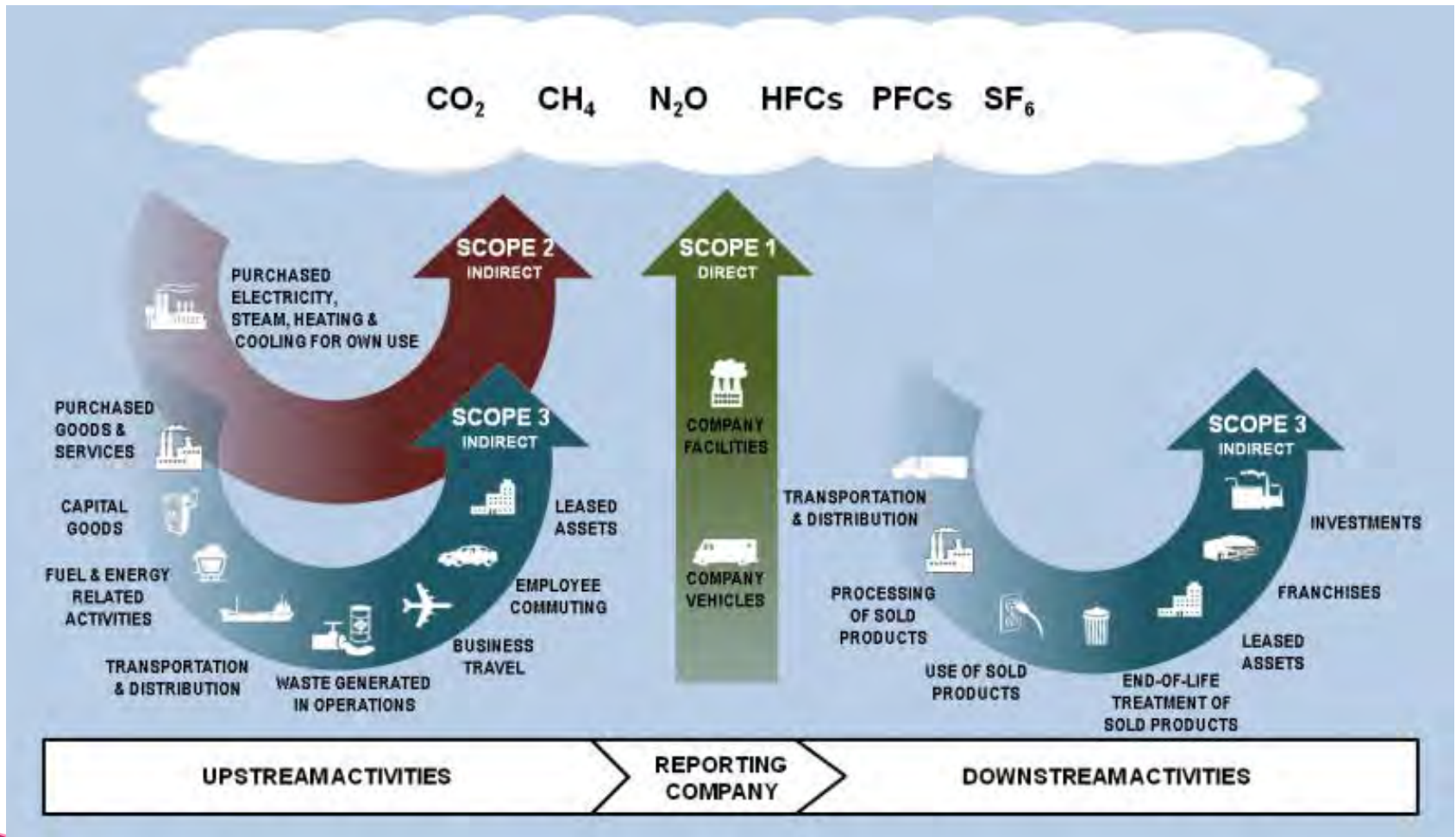
Gas	CO ₂ e multiplier	Uses in telecommunications
Hydro-Fluorocarbons (HFCs)	11,700	Refrigerants†, propellants‡ & cleaners
Sulphur Hexafluoride (SF ₆)	23,900	Electrical insulation§
Per-Fluorocarbons (PFCs)	6,500	Refrigerants† & fire extinguishers
Nitrous Oxide (N ₂ O)	310	Vehicle engines* & power generation
Methane (CH ₄)	21	–
Carbon Dioxide (CO ₂)	1	Vehicle engines & power generation

† Primarily air-conditioning systems. ‡ Fire prevention systems. * Car and truck fleets, business travel, travel to work, etc. § In purchased electricity from use in high voltage systems

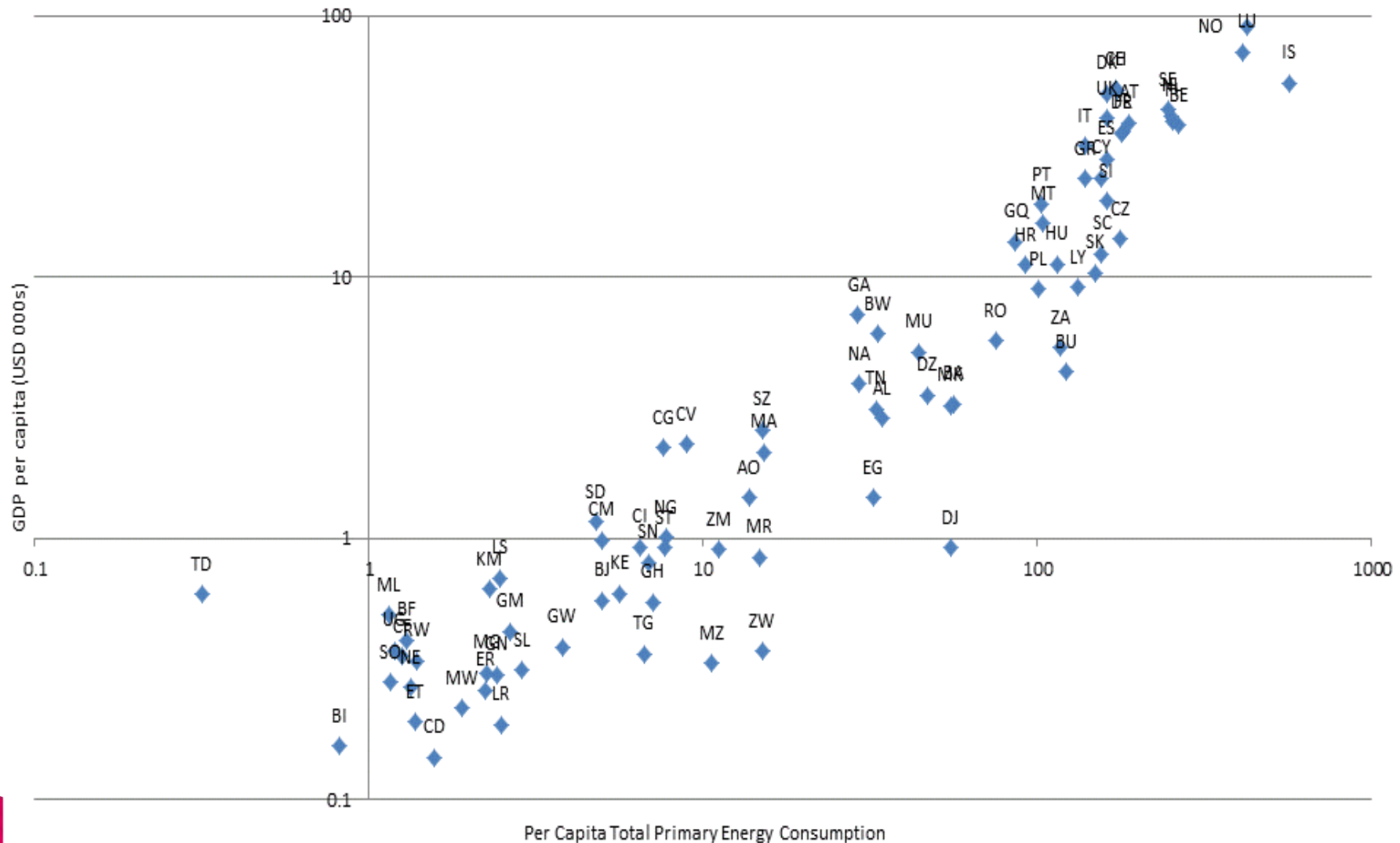
Complex calculations

- ▶ Inputs from manufacturers of components and other materials with their “embedded” GHG emissions;
- ▶ Use of energy (principally from fossil fuels) for processing; and
- ▶ Sale of goods and services to:
 - organizations as inputs to their sale of
 - goods, and
 - services,
 - households, and
 - individuals.

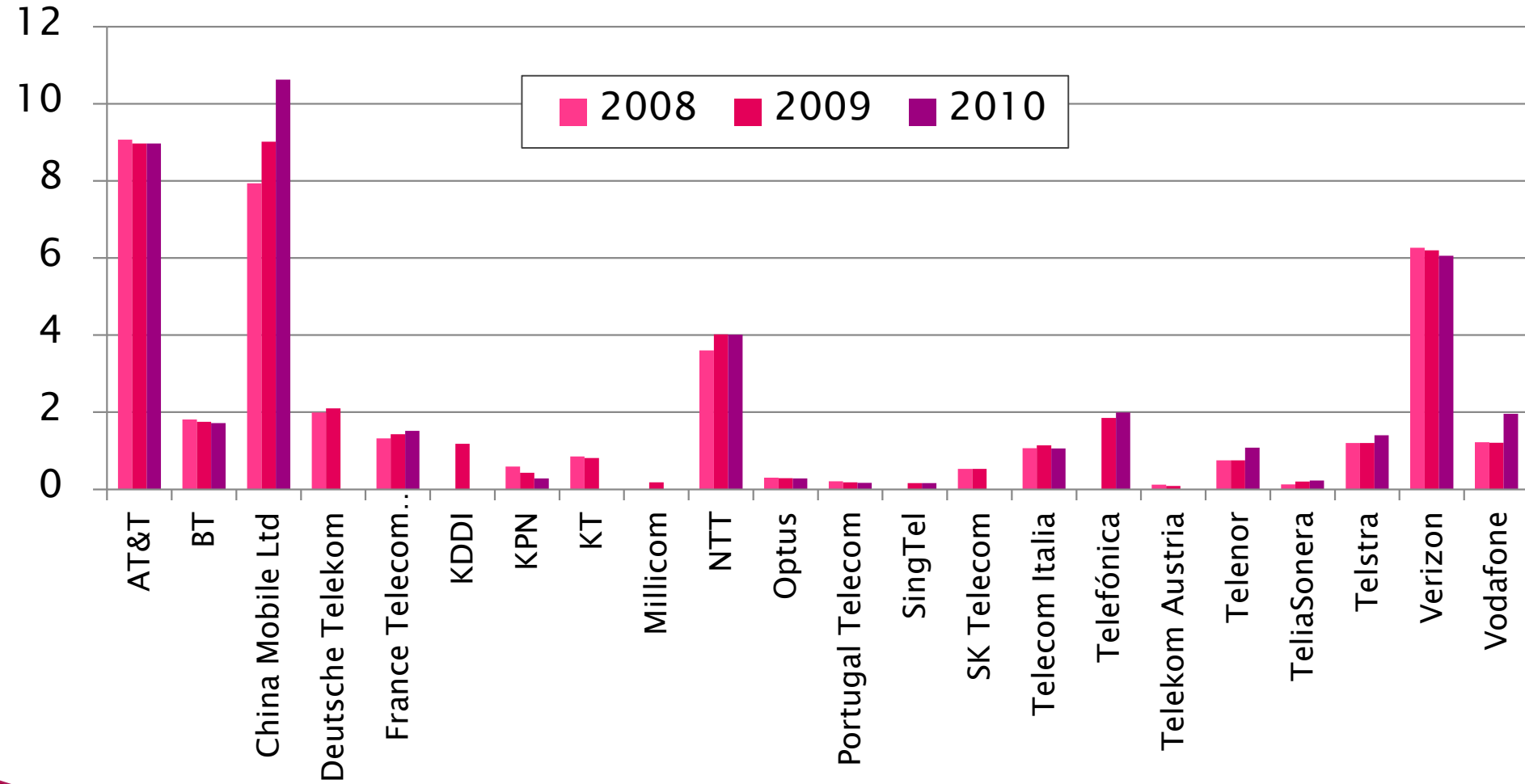
Corporate value chain for GHGs



GDP per capita versus energy consumption per capita



Reported emissions by operators (MtCO₂e)

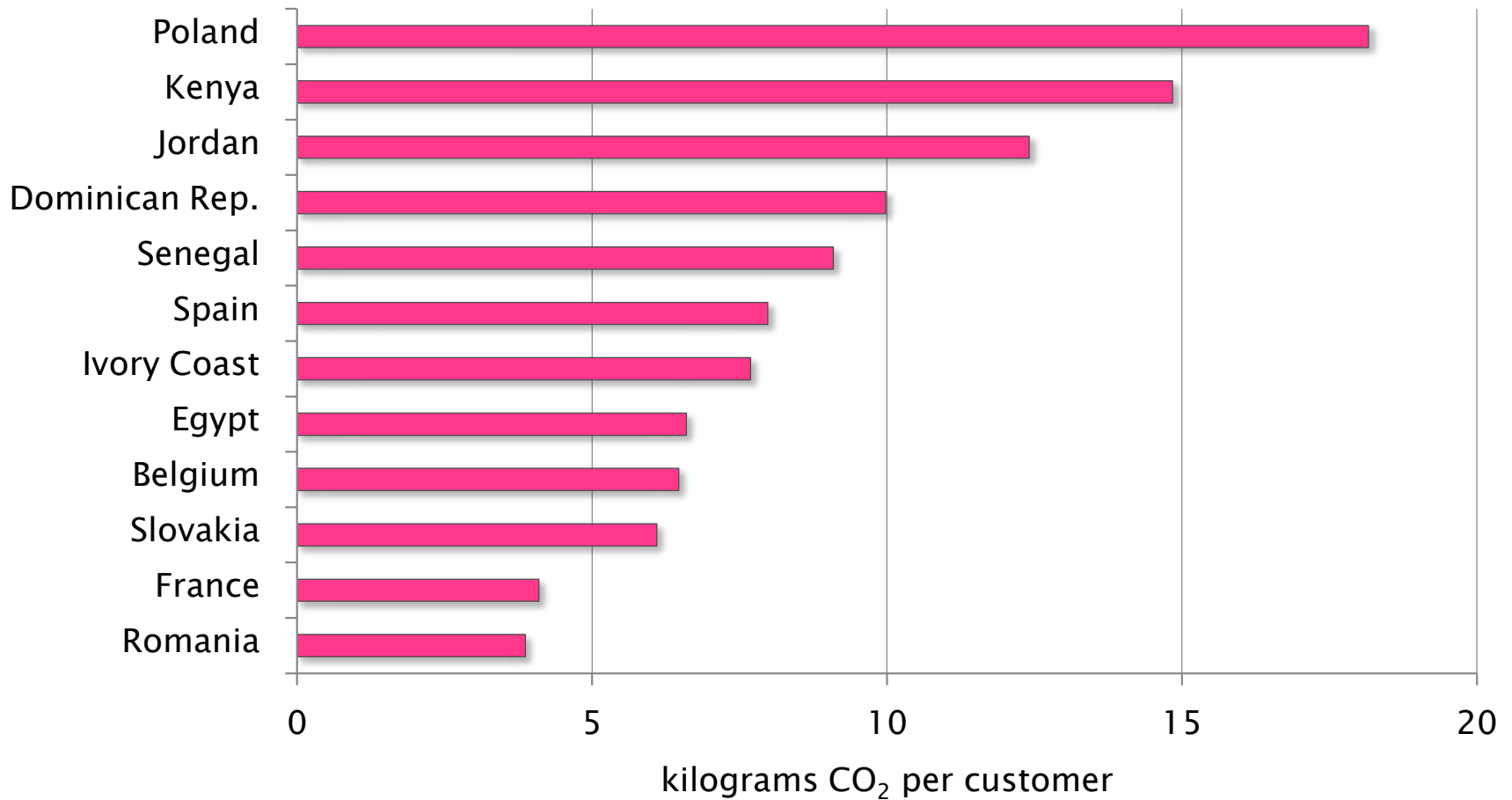


Total reported emissions 41.5 Mt

Operators that do not report GHGs

- ▶ América Móvil
- ▶ Axiata (Celcom) Malaysia;
- ▶ Bharti Airtel
- ▶ China Telecom
- ▶ China Unicom
- ▶ Comcast (USA)
- ▶ Department of Telecommunications – India (BSNL and MTNL)
- ▶ Digicel
- ▶ Etisalat
- ▶ Idea Cellular (India)
- ▶ Maxis (Malaysia)
- ▶ MTN
- ▶ MTS (Russia)
- ▶ Qwest (USA)
- ▶ Reliance Communications
- ▶ Saudi Telecom (STC)
- ▶ Softbank
- ▶ Telkomsel
- ▶ Turkcell
- ▶ Vimpelcom

France Telecom (Orange) Group



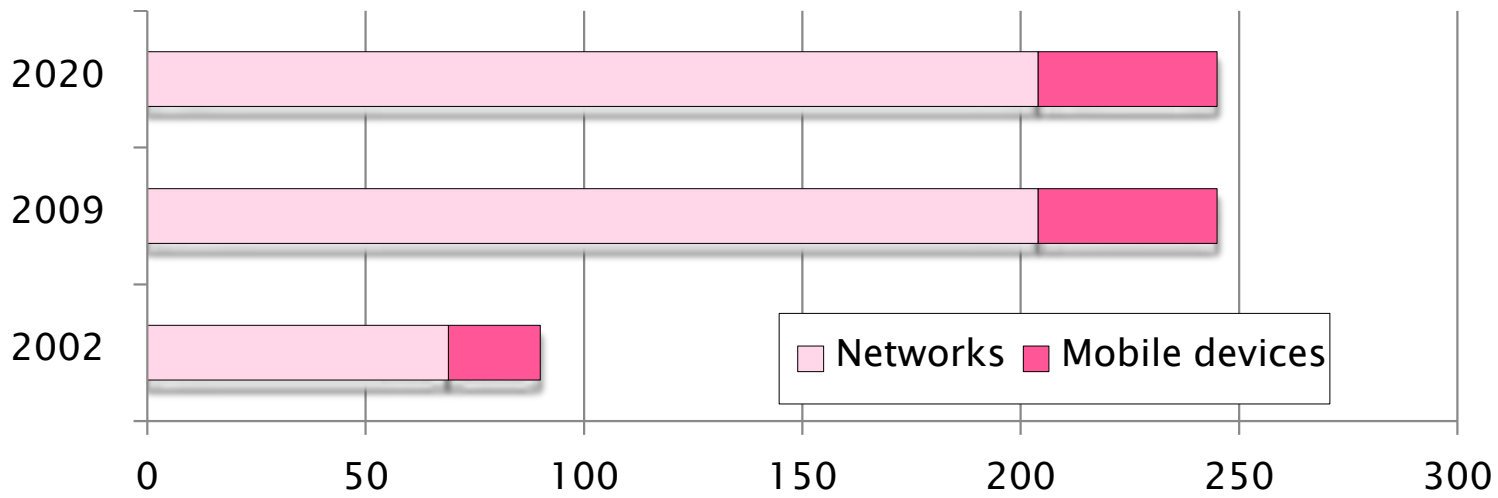
On-net off-grid customers (ONOG)

- ▶ Telecoms has outgrown electricity networks
- ▶ Base stations:
 - Powered by diesel generators
 - Supplied by diesel trucks
- ▶ Alternatives are capital intensive:
 - Photo-voltaic panels
 - Pico-hydro turbines
 - Wind turbines
- ▶ Trade-offs:
 - Reducing CO₂
 - Geographical expansion
 - Lower tariffs
 - Improved network quality

Reported emission by manufacturers (MtCO₂e)



Estimates of GHG emissions for the mobile industry (MtCO₂e)



Estimates of per capita emissions for mobile users (kg CO₂-e/user)

	2002	2007	2009	2020
GeSI	60			38
GSMA	78		53	31
EARTH		28		31

Conclusion

- ▶ Policy objective is to contain growth of emissions then to reduce them
- ▶ No intention to constrain adoption:
 - Limits economic growth
 - Undesirable socially
- ▶ No accurate figures for emissions from ICTs
- ▶ Much of it will be attributable to:
 - Entertainment and music
 - Consumer uploads

Further research

- ▶ Evaluation and audit of the Life Cycle Analysis (LCA) methodologies
- ▶ Collection and analysis of data on networks
 - especially in Africa where reporting has been very limited.
- ▶ Accurate forecasts for growth
 - Attribution of sources and destinations
- ▶ Evaluation of claims for efficiency gains
- ▶ Identification of global best practice
- ▶ Inclusion of GHGs in impact assessments

Thank you

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Ewan Sutherland, 15 November 2011
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