



**ITU**  
and climate  
change

# **ICTs: Environment and Climate Change**

International Telecommunication  
Union (ITU)

# Overview

- Why is ITU involved in Environment and Climate Change?
- The role of ICTs in combating climate change

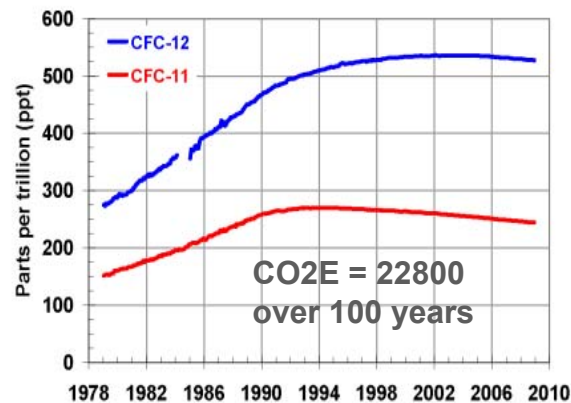
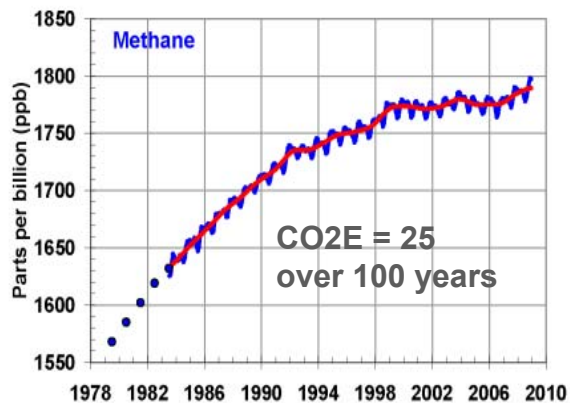
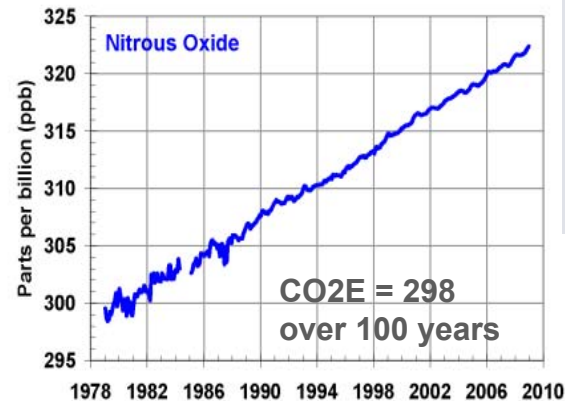
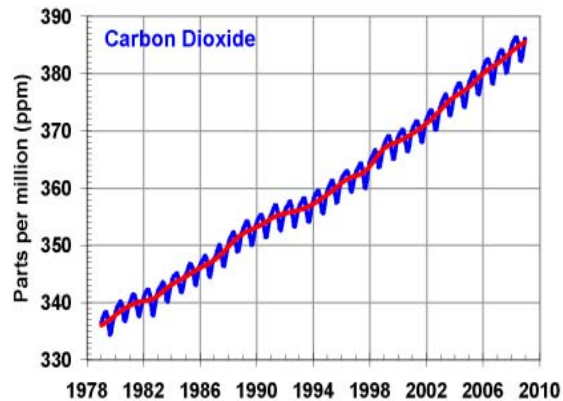


# ITU in brief

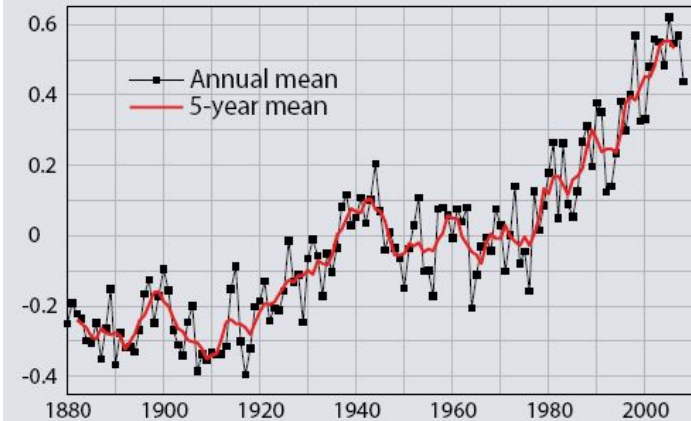
- ITU is the leading UN agency for information and communication technologies (ICTs).
- Oldest UN agency – 144 years old
- Central role in Connecting the World
- Organized in **three Sectors**:
  - **Radiocommunication**
  - **Standardization**
  - **Development**
- ITU is based in Geneva, Switzerland, with 192 Member States and >700 Sector Members and Associates.
- 760 staff, from 80 nationalities.
- Worldwide & regional exhibitions – TELECOM events



# Climate Change is happening



**Figure 1:** Global surface air temperature change



The global surface air mean temperature rose between 1951 and 1980. The period 1951-1980 is used as the baseline in the figure.

Source: GISS (2009b)

[http://www.unep.org/yearbook/2010/PDF/year\\_book\\_2010.pdf](http://www.unep.org/yearbook/2010/PDF/year_book_2010.pdf)

<http://en.wikipedia.org/wiki/File:NOAA-greenhouse-gases.png>

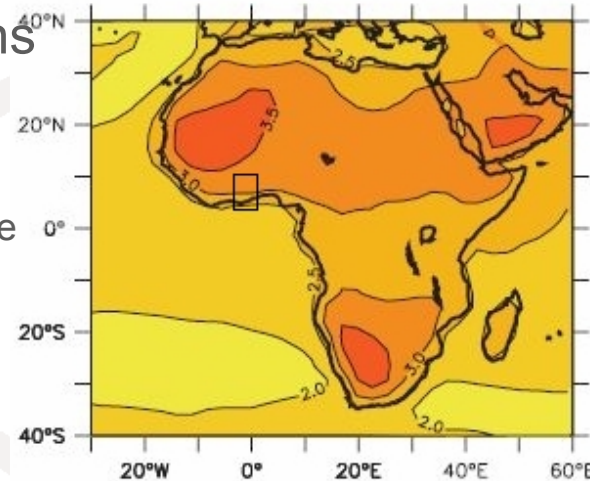
# Climate change 100 years ahead

1980-1999 to 2080-2099 - These are averages.  
Daily & seasonal weather changes could be bigger

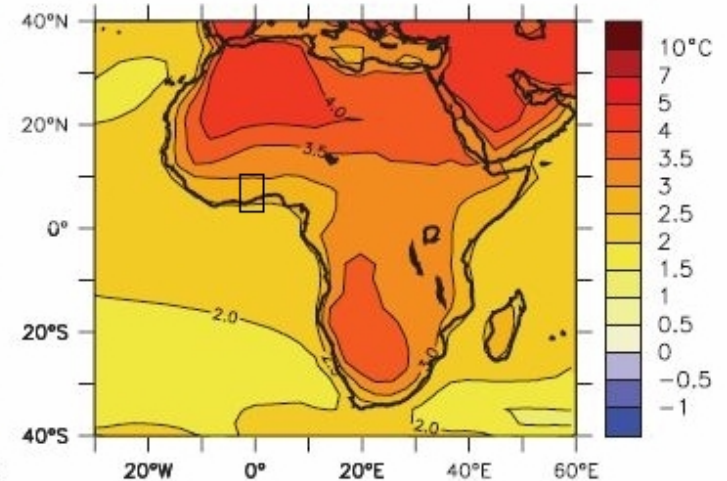
Temperature/months  
+3C DJF  
+2.5C JJA

Temperature

Dec, Jan, Feb

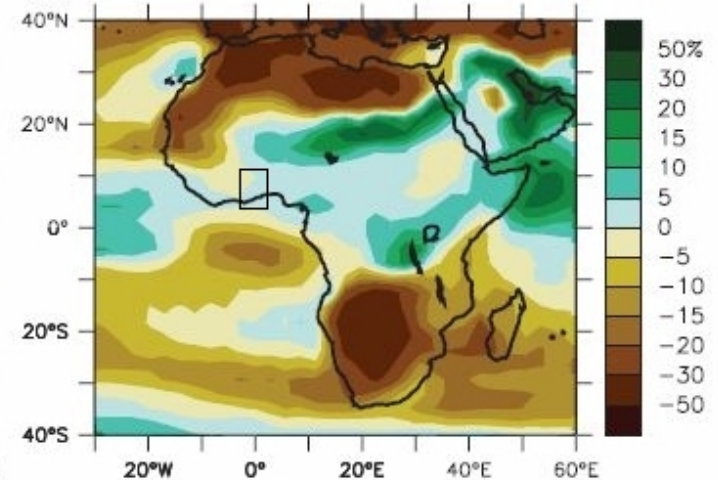
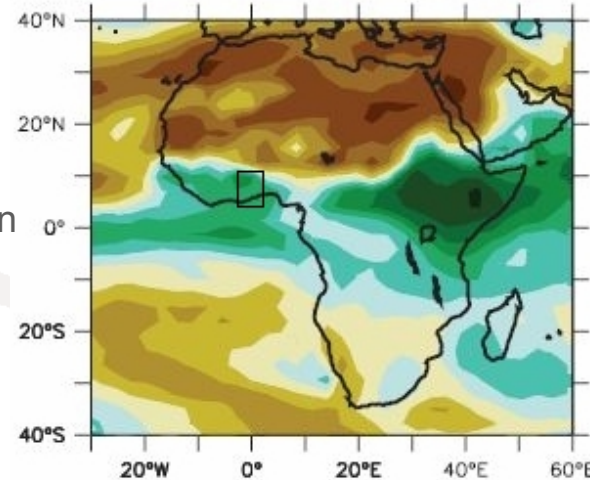


June, July, August



Rainfall  
+15% DJF  
+2.5% JJA

Rainfall



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# Sea Level Rise this Century

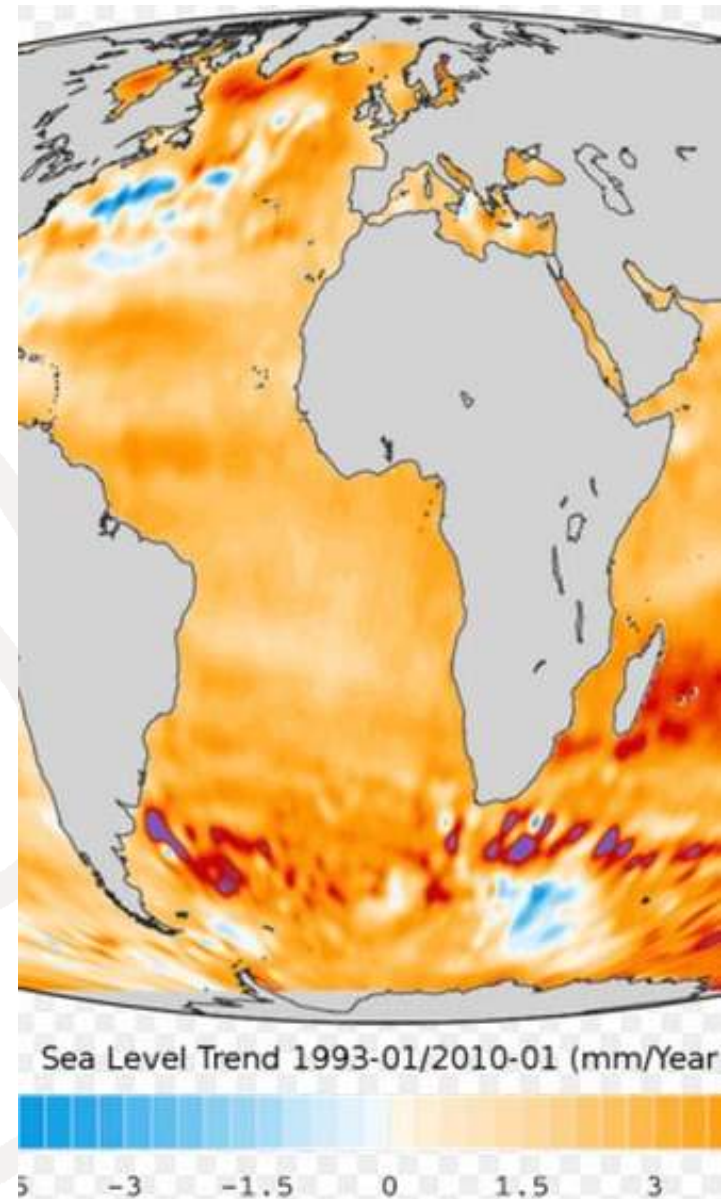
- IPCC 4<sup>th</sup> assessment report prediction [1] - 0.18-0.59m
- “Models of glacier mass balance (difference between melting and accumulation of snow and ice on a glacier) give maximum value for sea level rise in the current century of 2 metres (and a "more plausible" one of 0.8 metres), based on limitations on how quickly glaciers can melt [2,3].

[1] <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter6.pdf>

[2] <http://www.sciencemag.org/cgi/content/abstract/321/5894/1340>

[3] [http://en.wikipedia.org/wiki/Current\\_sea\\_level\\_rise](http://en.wikipedia.org/wiki/Current_sea_level_rise)

[4] [http://en.wikipedia.org/wiki/File:NOAA\\_sea\\_level\\_trend\\_1993\\_2010.png](http://en.wikipedia.org/wiki/File:NOAA_sea_level_trend_1993_2010.png)



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# ICTs can support the key areas of the Bali Action Plan



Shared  
vision



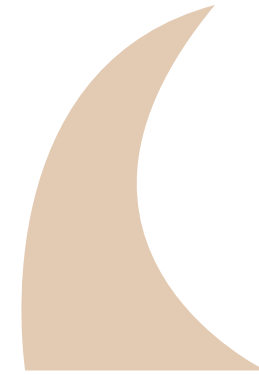
Mitigation  
of climate  
change



Adaptation



Technology  
development  
and transfer



Capacity  
Building



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# UN identified “it’s critical”



*“Climate Change is a global challenge that the world cannot lose.”*

Dr Hamadoun I. Touré  
ITU Secretary-General



*“Climate change is the defining challenge of our era. ITU’s work to cut greenhouse gas emissions, develop standards and use ‘e-environment’ systems can speed up the global shift to a low-carbon economy.*

Ban Ki-moon  
United Nations Secretary-General





## Importance further identified at top level

- Resolution 747 (WRC-07) “Radiocommunications use for Earth observation applications”
- World Telecommunication Standardization Assembly (WTSA)-08, Resolution 73, resolves that CC is a high priority in ITU
- World Telecommunication Policy Forum (WTPF) (April 2009), Opinion 3, instructs promotion of Res. 73.
- Global Standards Collaboration (GSC)-14 (July 2009), Resolution, encourages related collaboration, etc.
- ITU Council (Oct. 2009), Resolution 1307
- World Telecommunication Development Conference (WTDC)-10 (June 2010), Resolution on ICTs and CC, resolves to include, as a priority, assistance to developing countries in strengthening their human and institutional capacity in tackling ICTs and climate change
- Plenipotentiary-10 (October 2010), Resolution on ICTs, CC and the Protection of the Environment

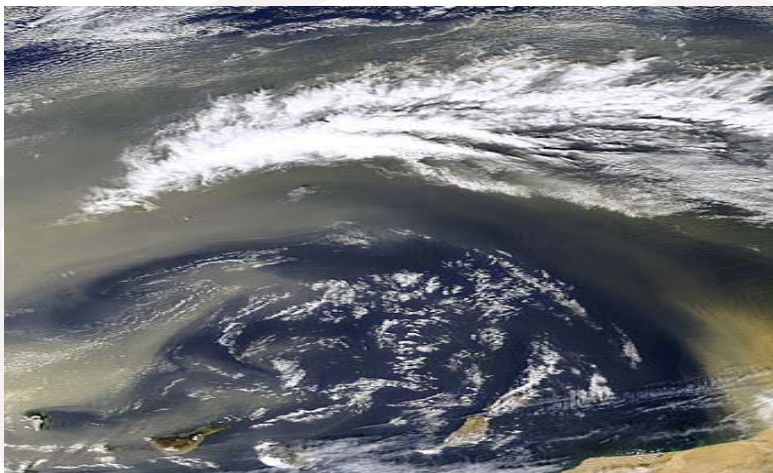


# Mitigation

- Reducing energy consumption
- The promotion of Next Generation Networks (reducing power consumption by up to 40%)
- Standards and Plan for switchover from analogue to digital broadcasting – reduction transmitter consumption ~10 time
- ICT as key enabler to reduce emissions in other sectors (Transport, Building, etc..)
- Recycling, e-waste, lifecycle analysis
- All new standards are now checked for energy efficiency
- New Study Group on Environment and Climate Change (ITU-T SG5)



# ITU IS HELPING TO MONITOR CLIMATE CHANGE BY:



- **Conducting and managing studies on remote-sensing**

- **Satellite monitoring**



- **Providing key climate data via radio-based applications**

Engage @ [www.itu.int/itu-t/climatechange](http://www.itu.int/itu-t/climatechange)



# Adaptation

- Support to get telecoms up and running after disasters
  - Recent examples Pakistan, Haiti and Chile
- E-Environment Toolkit will help countries to assess the contribution that ICTs can make to reduce GHG emissions
- New Question
  - ITU-D **SG2, Q24/2**: ICT and Climate Change



# New ITU- GeSI Report

Using ICTs  
TO TACKLE CLIMATE CHANGE



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**GeSI**  
GLOBAL e-SUSTAINABILITY  
INITIATIVE

# ICTs can help with Climate Change:

- by cutting emissions in ICT sector through introduction of more efficient equipment and networks
- by reducing emissions and enabling energy efficiency in other sectors
- by helping countries adapt to the negative effects of climate change



# Why consider energy saving in ICT and networks?



- Electrical energy is a limited resource
  - Mainly dependent on a mix of fossil fuels and nuclear
- Optical networks need electrical energy to function and are on a path of exponential growth and upgrade (like their end devices- server, pc, TV etc)
  - Worldwide coverage needed
  - Moore's law leads to obsolescence every 2-4 years
- Every 1W saved at the edge
  - is worth one power plant worldwide
  - reduces CO<sub>2</sub> emissions and other waste products



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# NGNs will reduce energy consumption

- Significant decrease in number of switching centres required
- More tolerant climactic range for NGN equipment
- Use of more advanced technologies such as VDSL2 and PONs



# Environmental Load Reductions possible using ICTs

- Consumption of materials
- Power/Energy consumption
- Movement of people
- Movement of materials
- Improved efficiency of office space
- Storage of goods
- Improved work efficiency
- Waste



# Standard for a universal charger for mobile phones

- “Universal power adapter and charger solution for mobile terminals and other ICT devices” (ITU-T Recommendation L.1000)
  - specifies general requirements
  - covers charger for mobile phones
- Future version will cover other ICT devices



# ITU's universal charger standard

**Instead of this ...**



**... have this:**



**Recommendation L.1000  
Approved March 2010**

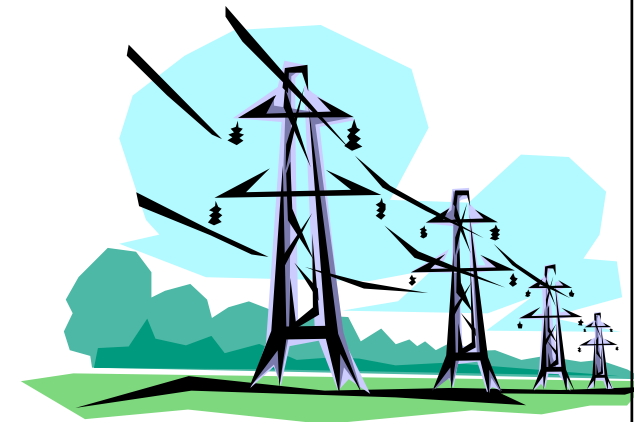
# Transport: Travel Avoidance using ICT

- Tele-working
  - “Up to 260 MtCO<sub>2</sub>e savings each year (detailed assumptions in Appendix 3). For example, in the US, if up to 30 million people could work from home, emissions could be reduced 75-100 MtCO<sub>2</sub>e in 2030, comparable to likely reductions from other measures such as fuel efficient vehicles”
  - Delivers less benefit if your home’s heating and cooling is less efficient than at a central office
- Tele- and videoconferencing
  - “Conducting meetings online or on the phone instead of face-to-face – could also reduce emissions
  - Previous conservative estimates have suggested that tele- and videoconferencing could replace between 5 and 20% of global business travel
  - Advanced videoconferencing applications in the early stage of adoption could have a very significant impact in transport sector reduction”



# Energy Industries with Smart ICT

- 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



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# Waste Management with Smart ICT

- Waste management often linked to farming because of methane emissions
- In the context of ICT, there is
  - Industrial waste during production
  - Waste due to obsolescence
- A 'cradle to cradle' raw material and recycling approach aims to keep all the materials in circulation [1]
  - Design includes easy disassembly
  - Obsolete products returned to factory
  - No need for mining of raw materials



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# Agriculture with Smart ICT

- Control of watering and fertilisers using satellite imaging and Global Positioning Systems
  - *“In the past a complete field would receive the same treatment, whereas precision farming makes it possible to split up the crop into sub-field management areas. Today it is even possible to conduct spatial analysis of the crop in blocks as small as 20m by 20m. This allows local soil or climate conditions to be taken into consideration and encourages more efficient fertiliser application”.*



A nitrogen management map for winter wheat.



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[http://www.geoconnexion.com/uploads/precisionfarming\\_intv9i5.pdf](http://www.geoconnexion.com/uploads/precisionfarming_intv9i5.pdf)

## What policy makers should consider...

- Raise awareness of the positive role that ICTs can play in combating climate change
- Integrate ICT policies and strategies relating to climate change, energy and environment
- Engage the private sector
- Encourage the development of methodologies for assessing the impact of ICTs on environment
- Develop and implement a national emergency and telecommunication plans







# ITU @ UNFCCC

- Ongoing role in UNFCCC process
  - Promoting the role of ICTs in reducing GHGs
  - Providing technical assistance to developing countries
  - Innovation and the transfer and dissemination of technologies, including ICTs, is key to both mitigation and adaptation.
  - Standards are essential for the wide adoption of new technologies anywhere in the world.





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*"ITU is one of the most important stakeholders in terms of climate change."* - **UN Secretary-General Ban Ki-moon**

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