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# Africa and Climate Change

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Presented to ‘Africa Beyond Aid II’

# Contents

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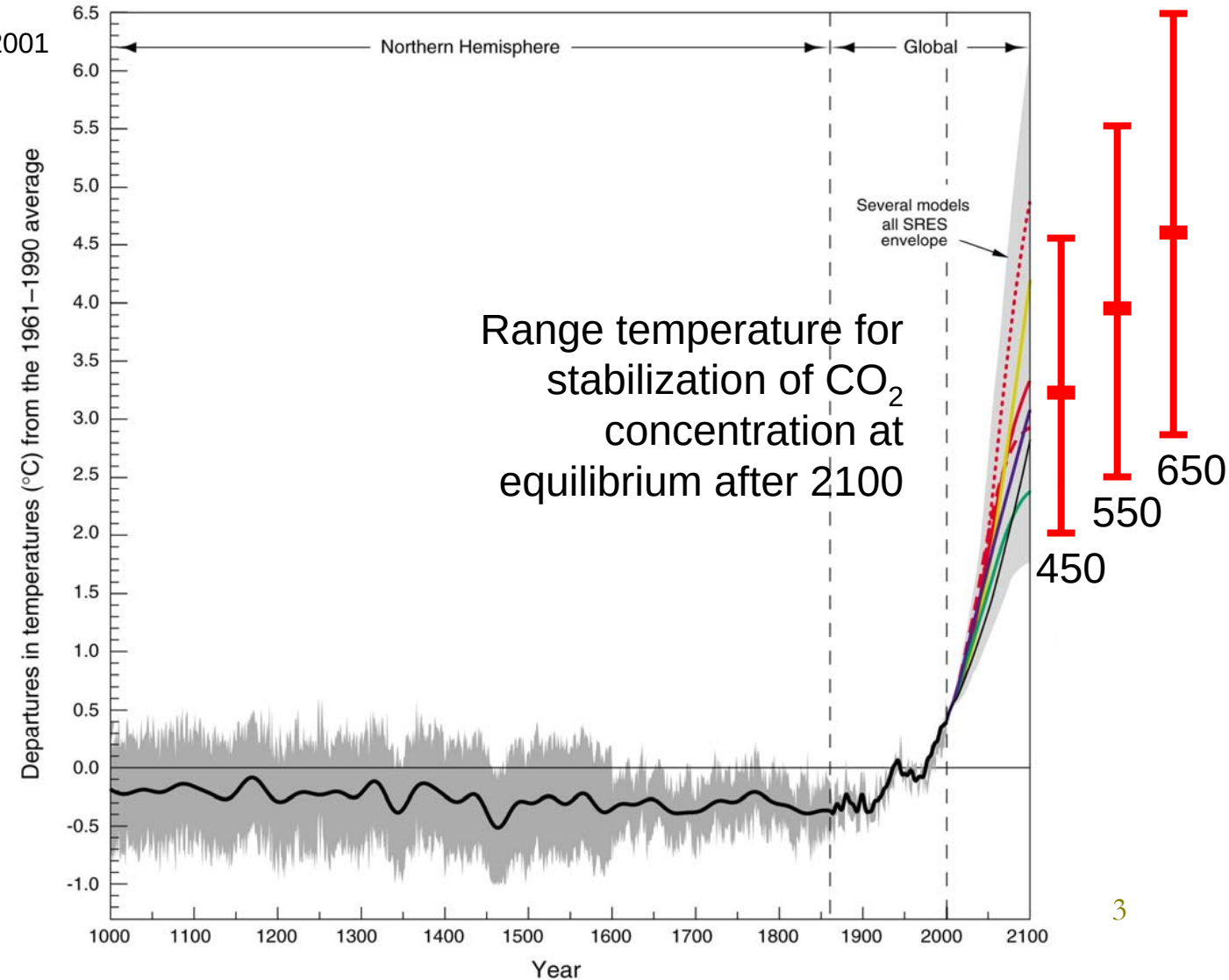
- Development in a Changing Climate
- Impacts in Africa
- Responses and policy options
- Opportunities

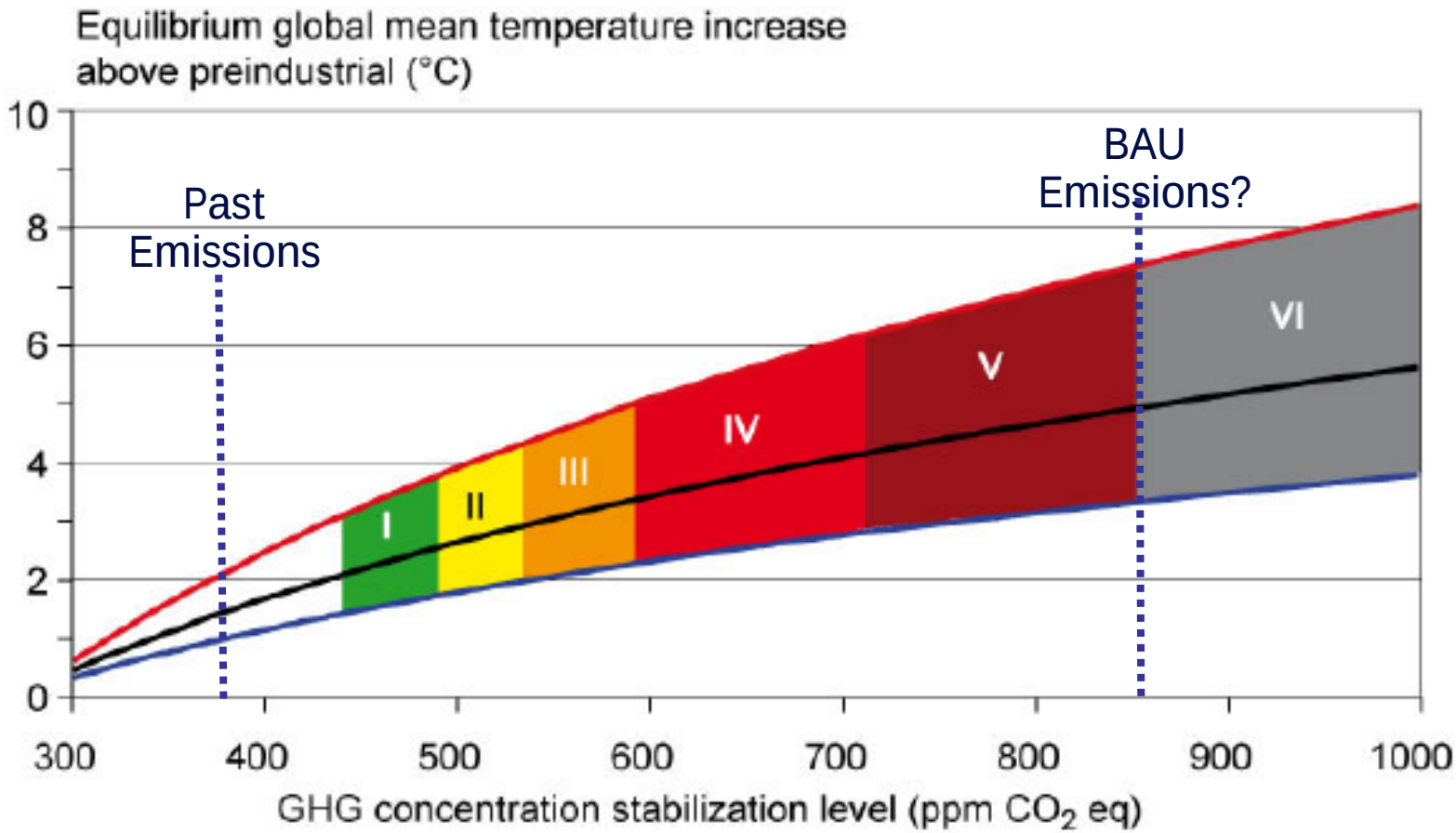
# Climate Change – past and future

Source: IPCC Synthesis Report, 2001

- **1000 to 1861, N. Hemisphere, proxy data;**
- **1861 to 2000 Global, Instrumental;**
- **2000 to 2100, SRES projections**



# Past GHG emissions will result in 1.6C warming. Business as Usual will result in a rise of up to 6.5C by 2100




Source: IPCC (2007)

# Direct effects of climate change

- Temperature rise
- Changing rainfall patterns – wetter and drier
- Glacier melt – declining water availability
- Sea level rise – flooding and intrusion
- Extreme weather events - storms; droughts etc

Climate vulnerability is geographical – climate impacts depend on social system resilience and adaptation

# Energy and Climate Security - impacts on development

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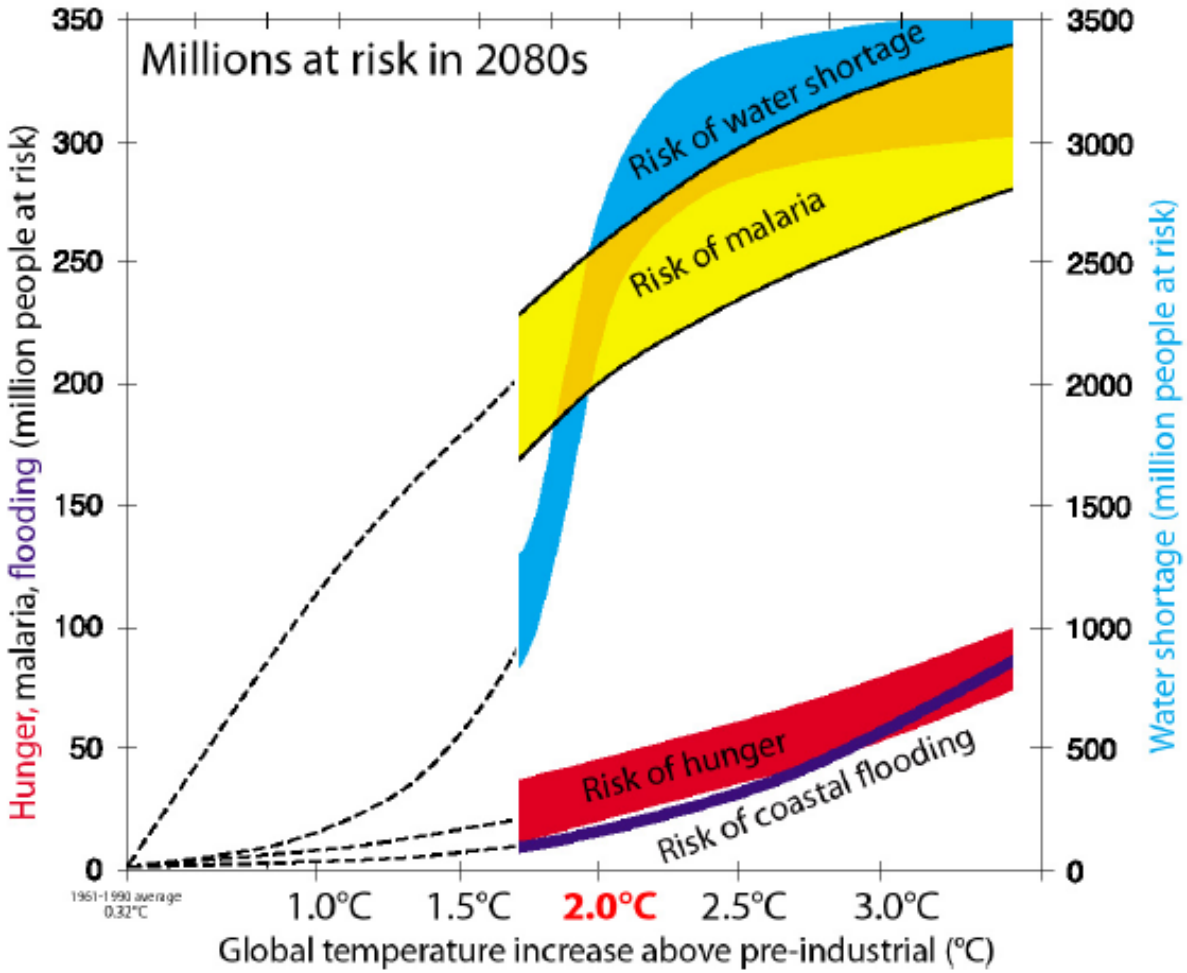
- Stern Review estimates cost of climate change to be between 5-20% of global GDP from 2050
- Recent oil prices rises have annual cost to developing countries $137 billion – compared to $85 billion in net aid
- 2005 saw the highest global financial losses due to weather-related disorders costs to be borne by the world's economies exceeding US$185bn
- Weather disasters could cost as much as a trillion dollars in a single year by 2040
- Humanitarian costs could rise by 200% by 2015 under higher climate change scenarios

# Global temperature rises above 2$^0$C will greatly increase humanitarian risks and impacts on poverty reduction



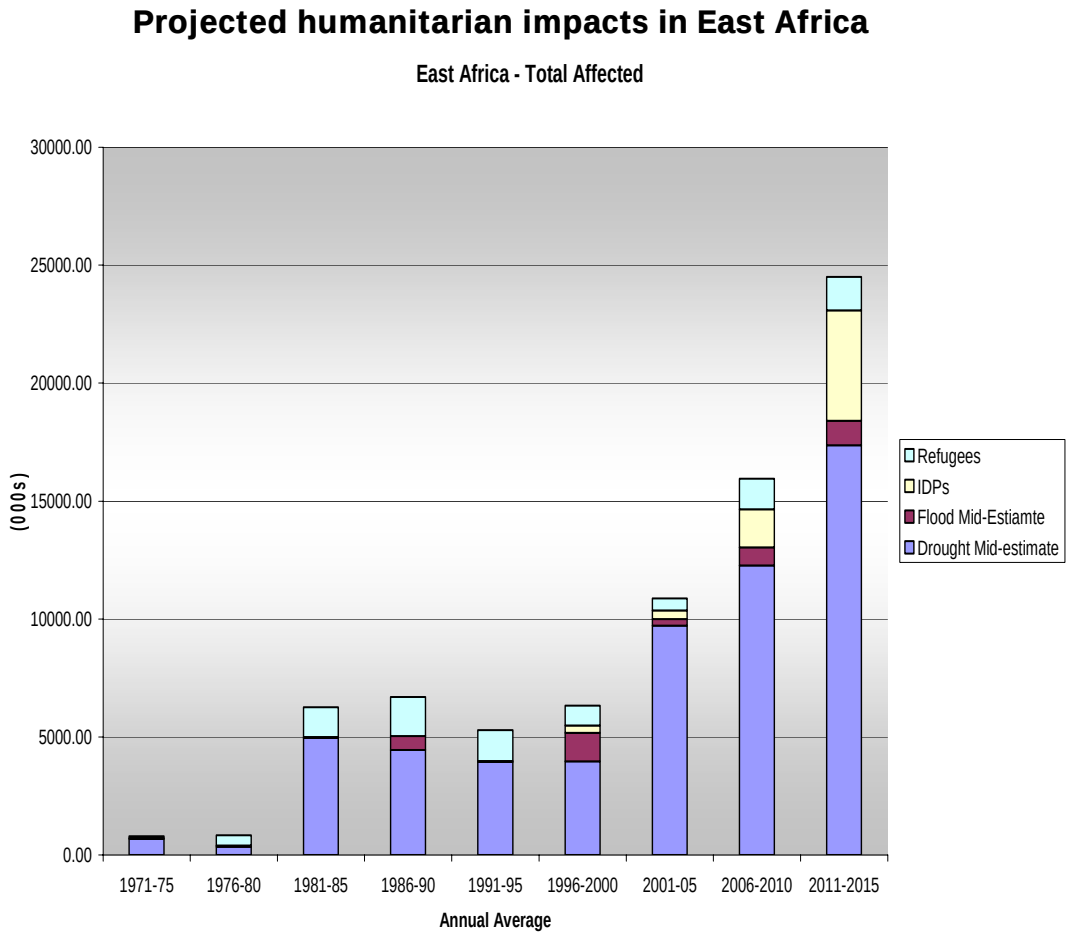

- Climate change beyond 2C risks catastrophic and irreversible impacts on ecosystems and ecological systems
- There is a high risk that beyond a certain tipping point "positive carbon feedbacks" could make climate change uncontrollable

Source: Vattenfall (2007); IPCC WG II (2007)

# Increased climate extremes are also driving near-term humanitarian crises, social instability and conflict

- Climate change is driving near term increases in climate variability and extremes. This will increase humanitarian costs from drought, floods and extreme storms.

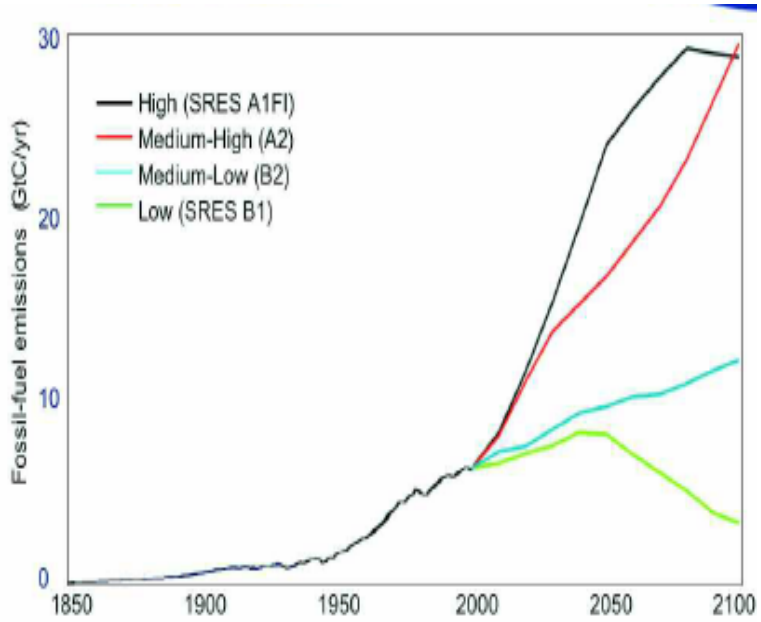
- UN Security Council debate on climate change in April 2007 showed strong developing country views that climate impacts were increasing risks of crisis and conflict.



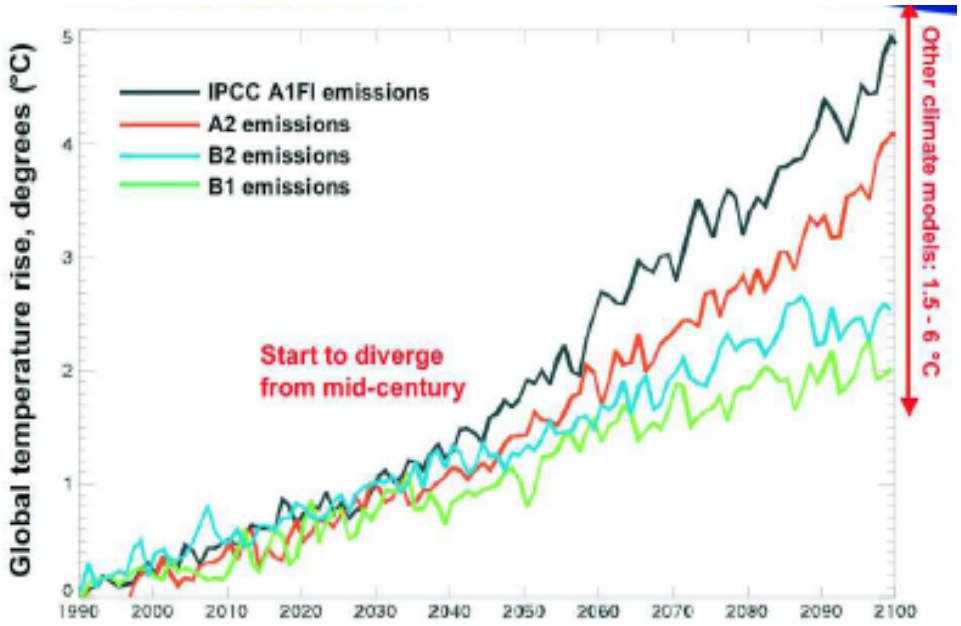

Source: Kings College London, International Policy Institute (2006); MOD/DCDC, Global Strategic Trends 2006; FCO Africa Research Analysts, 2007.

# Large scale adaptation is needed for at least 40 years – even with the most aggressive mitigation measures

**Emission Scenarios Diverge Radically …**




**But impacts only begin to slow after 2040**




**The low emissions scenario is consistent with a 450ppm (CO2 eq) atmospheric concentration**

**This effort would give a 50% chance of limiting temperature rise to 2C, and requires global emissions to peak by 2020**

Source: Hadley Centre (2006)

# Climate change will threaten development, increase humanitarian spending, and put pressure on aid budgets and capacity

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- Climate change will impact the poorest people in the poorest countries first; all poverty reduction efforts will be affected. OECD estimates 15-60% of aid spending is vulnerable to climate change.

- 350 million people could be displaced by climate change by 2050. By 2015, the share of DFID's budget devoted to humanitarian costs could almost double, from 12% to 23%. Increased risks of instability and conflict driven by climate change will add additional costs.

- Estimates for adaptation spending in developing counties range from $10-$40 billion per annum for conservative assumptions.

**Failure to deliver aggressive mitigation measures and/or effective adaptation will result in development and humanitarian crises.**

Sources: OECD (2005); Christian Aid (2007); Kings College London, International Policy Institute (2006); World Bank (2006); Tyndall centre (2007).

# Contents

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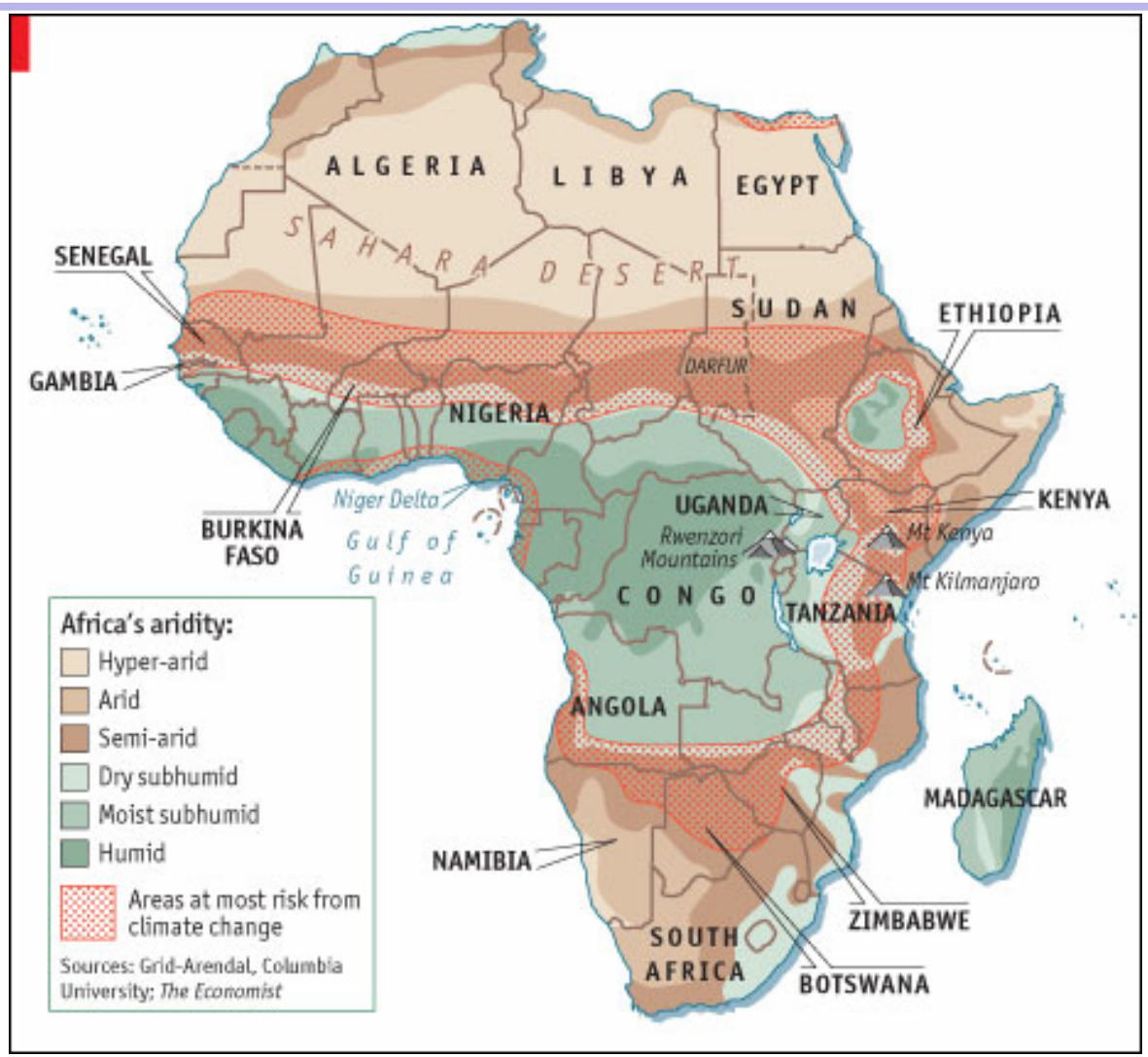
# Impacts in Africa

- Temperature rises will be lowest near the equator – except in continental areas
- Rainfall decreasing in N Africa and Sahel and Southern Africa; increasing in East Africa
- Rain seasonality increasing – and drought cycles
- Flooding in Niger Delta and coastal areas

# Africa's Vulnerability to Climate Change



# 70% of the African population relies on rain-fed agriculture or pastoralism

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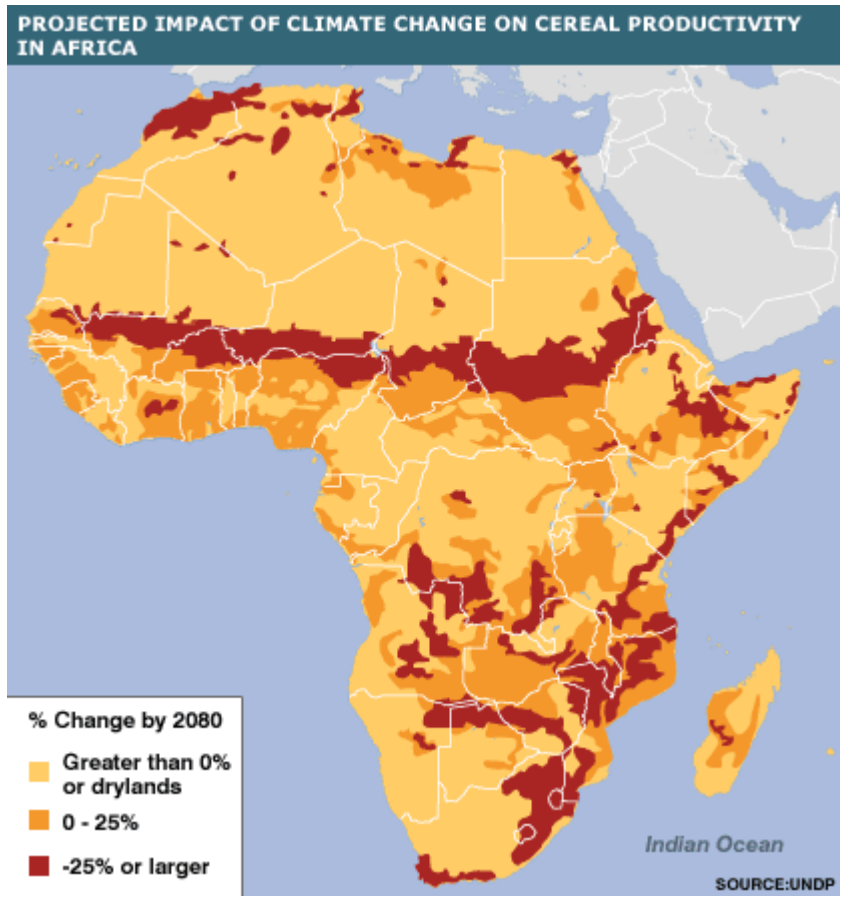
•IPCC 2007: 'agricultural production, including access to food, in many African countries and regions is projected to be severely compromised by climate variability and change. The area suitable for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. This would further adversely affect food security and exacerbate malnutrition in the continent. In some countries, yields from rain-fed agriculture could be reduced by up to 50% by 2020.'

•600 000 sq km of cultivable land may become unsuitable for agricultural activities. Soya bean harvest is expected to drop close to 30% by 2050

•Stern predicts that crop yields in the whole of Africa will fall as much as 30% by 2050.

•A University of Pretoria study estimates that Africa might lose $25 billion in crop failure due to rising temperatures and another $4 billion from less rain.



# Water availability limits growth

- Countries dependent on hydro power have seen large falls in GDP due to recent drought: Kenya (20% fall); Tanzania (30% fall)
- Nile could see up to an 80% fall in flow towards the end of the century
- Tension between commercial and subsistence crops will grow if irrigation expands
- Some increased rainfall could benefit agriculture

# Migration and Social Instability

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- Climate change may create up to 50 million 'environmental' refugees by the end of the decade, mainly in Sub-Saharan Africa
- One study suggests that a sea-level rise of just 50 centimeters – half the most optimistic estimates – will displace two million people from the Nile Delta.
- Pace of urbanization will increase in many areas
- Already fragile societies will be further stressed by climate change. Response often likely to be instability and conflict not adaptation: Current examples include: Sudan; Ghana; Ivory Coast

# Contents

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# Climate Change: The Development Imperative

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- **2°C Agreement**: Achieve a global agreement in 2009 to limit temperature rise to 2°C, with the resources and institutions to implement it.

- **Adaptation**: Develop a comprehensive approach to climate change adaptation (including enhanced humanitarian and disaster relief), including additional investment and improved governance/conflict prevention.

- **Additional resources**: Ensure in the medium term that international resources for climate change mitigation and adaptation are additional to currently committed ODA

# High risk that the interests of poor countries and poor people will be sidelined in the 2009 Global Climate Deal

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- As with global trade, there is a high risk that the interests of LICs will be squeezed out of any global climate deal
- Large MICs seem to be backing the interests of their urbanised and industrialised minorities who would face carbon restrictions, against their poor majorities who will face the impacts of climate change. Though dynamics are different in each country.
- OPEC and oil producing countries will also resist ambitious targets
- Additional funding for adaptation is failing to receive a high priority among key decision makers

**African countries will need to play a much more pro-active role in order to achieve an effective "pro-poor" climate deal in 2009**

# African Adaptation Responses

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- Investment in understanding impacts of climate change – monitoring etc.
- Ensuring infrastructure investment is “climate proofed”: power; water; sea defence; buildings
- Integrating climate predictions into development planning: agriculture; tourism etc
- Managing extreme weather events
- Agricultural extension to communities to help individual adaptation as traditional knowledge is made redundant

# Adaptation costs will be a growing part of development spending

| Cost Scenario | Total Developing Country Cost ($million per year) |
|---|---|
| Low estimate | **1300** |
| Middle estimate | **4500** |
| High estimate | **7700** |

Adaptation costs are manageable in 2015, but will grow rapidly beyond that and have very high degrees of uncertainty

Funds likely to be strongly linked to growth in carbon markets

# Beyond Technical Adaptation Measures

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- Adaptation discussions have mainly focused on capacity building, technical and investment measures, linked to international funds

- This assumes governments will act to reduce climate impacts on their citizens. But in weak states with predatory elites, or where resources are managed on communal lines, climate change will magnify social stresses increasing the risk of conflict and instability.

- In many areas in Africa and Asia the only form of adaptation will be migration, with 200-400 million people at risk by 2050. Managing the stresses of migration between and within states will require strengthened humanitarian and political action.

**In many vulnerable countries - especially in Africa - adaptation will take the form of strengthened humanitarian response and targeted conflict prevention, with a strong political element needed.**

# Contents

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# Benefits from climate policy

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- Increased clean energy investment from Clean Development Mechanism (currently $10 billion pa)
- Biofuels opportunities (e.g. Brazil-Tanzania-UK), but impacts on food prices and land could be negative
- Funding for avoided deforestation and reforestation – link to national environmental services: watershed protection etc
- Increased emphasis on energy access to poorest in World Bank etc
- Adaptation funding allowing infrastructure modernisation

**Stern Review = $70bn pa additional energy investment**

**World Bank = $25-50bn pa additional energy investment**

# Aggressive mitigation implies large investment shifts inside (and out of) the energy sector

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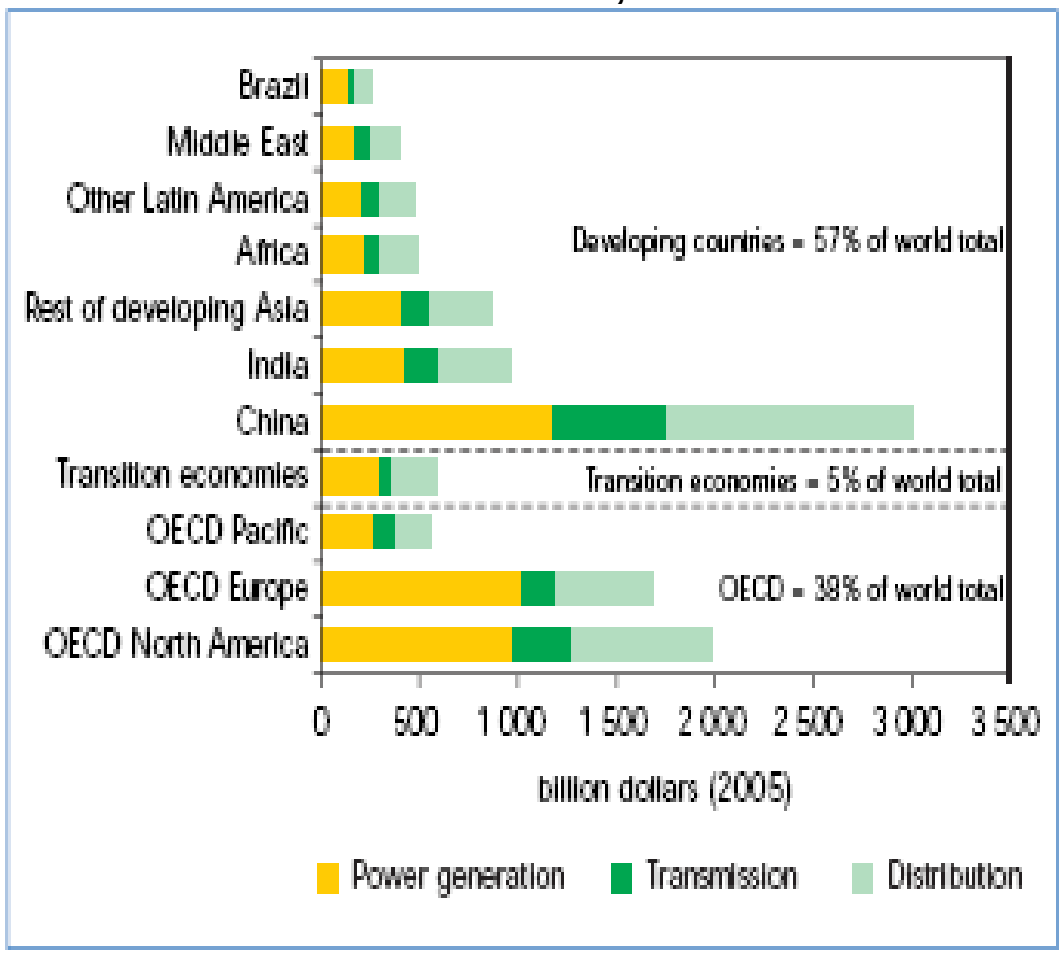
**The IEA alternative scenario**

- Energy sector investment falls from $19-21 trillion to $9-11 trillion.
- $2 trillion lost from power sector
- $2.4 trillion more investment in energy efficient goods by 2030.

**Cumulative Power-Sector Investment by Region in the Alternative Scenario, 2005-2030**

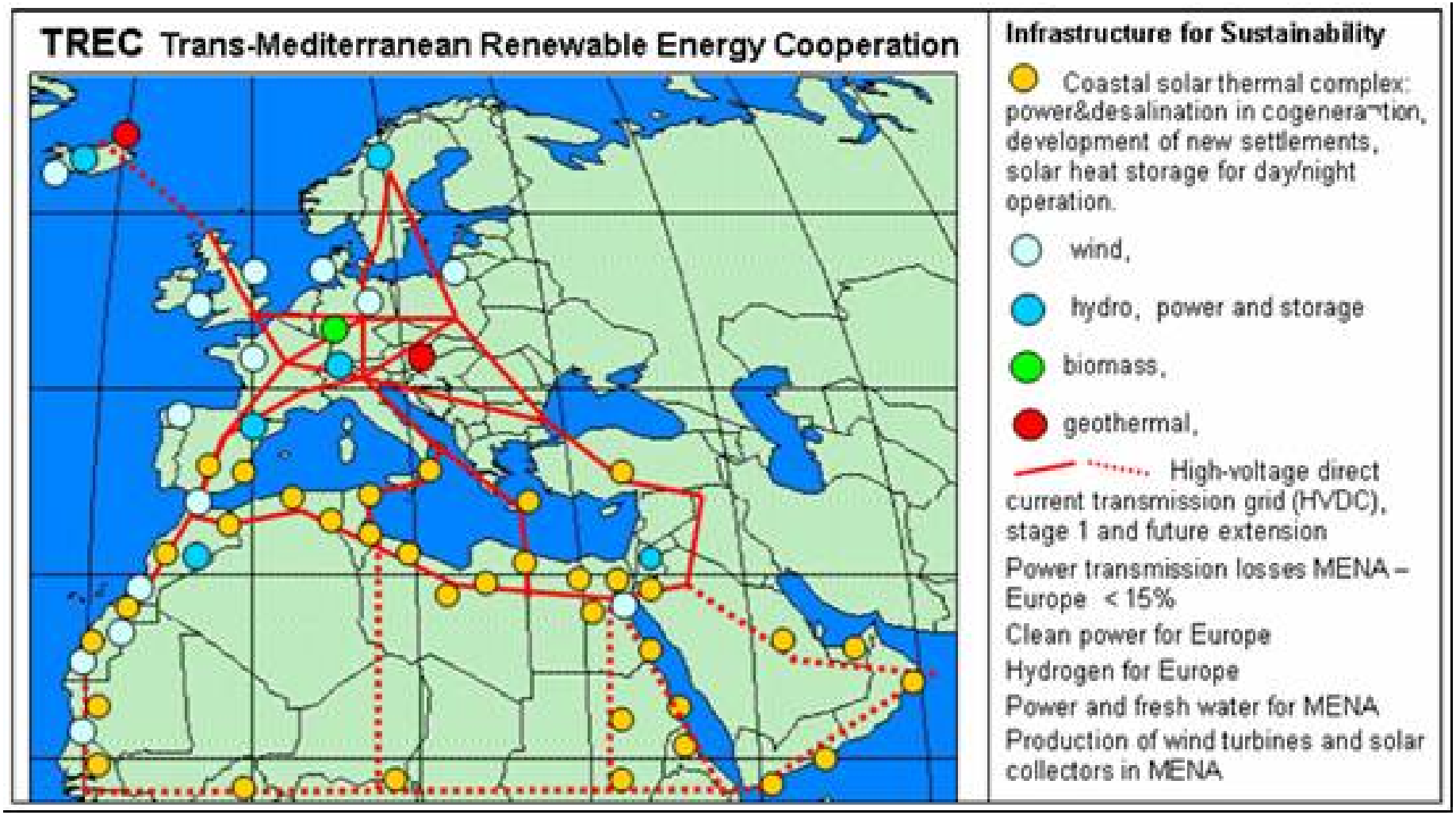



Source: IEA (2006)

# Changing African emissions

- Outside South Africa and Nigeria, Africa's emissions are negligible and face no international limits to 2050
- But clean technology revolution driven elsewhere should allow Africa to leapfrog to a cleaner and more efficient energy system
- Avoiding energy import costs would be a clear development benefit – 2005 oil price rises cost 3.5% GDP in African oil importing countries
- Need to plan energy system now which is compatible with a carbon constrained, climate changed and high price energy world. Generates difficult choices e.g. hydro vs coal in Tanzania

# Africa: Renewable Energy Powerhouse?



# Thank You!