PRESENTATION

Rethinking Post-2015 Development

Conceptual and Policy Implications Beyond MDGs

Saturday, April 18th, 2015

Venue: EDR (Educational Divide Reform)
30 JFK St. 3F & 4F, Cambridge, MA 02138

Cosponsored by: CASID, EDR and the PhD Program in Global Governance and Human Security at UMass Boston

Sustainability Goals and Climate Change Policy for Energy Production

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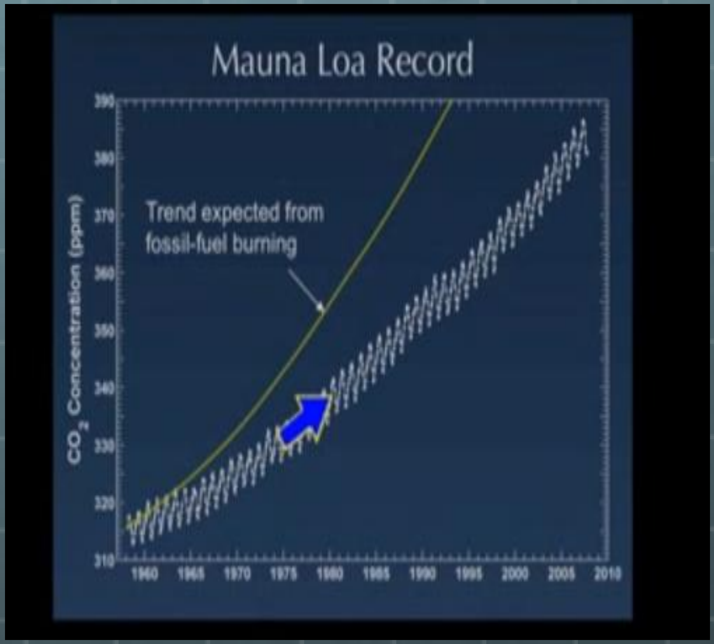
Outline

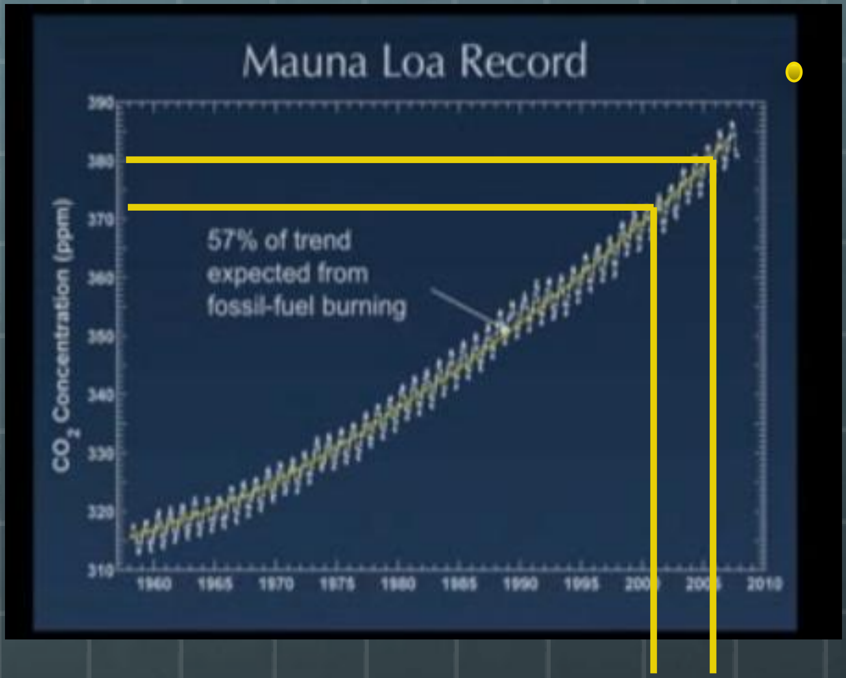
- As SDGs increase focus on environmental concerns, climate change policy increases focus on development.
- Why is climate change energy policy becoming more development conscious?
  - How well goals are achieved
  - How goals are change
  - Applicability (expected effectiveness) of existing policies

Economic security is linked to Ecosystem stability

- Changes from MDG to SDG
  - More attention on environment
- Climate Change Policy Tools
  - More attention on development-type policy such as technological innovation and system coordination
    - ★ Carbon capture and storage
    - ★ Renewable fuel technologies
    - ★ Energy efficiency

Simple correlation between fossil fuel burned and atmospheric CO_2

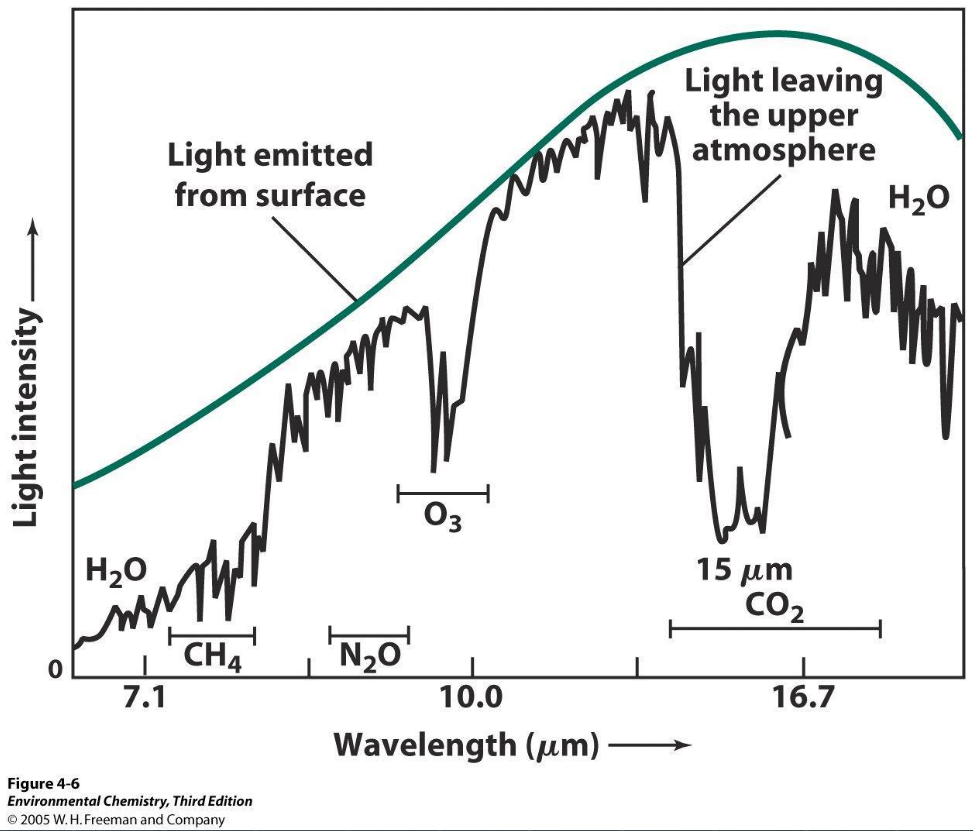




- Rough increase of 8 ppm every 5 years
- Last week's average was 404.7
- At this rate in 30 years (2045) it will be 453ppm

source: Keeling, 2009 19:33, 19:56

Some types of gases absorb thermal infrared energy that would otherwise leave the atmosphere



Source: Freeman 2005, as presented in Dransfield 2014

Regional temperature trends differ

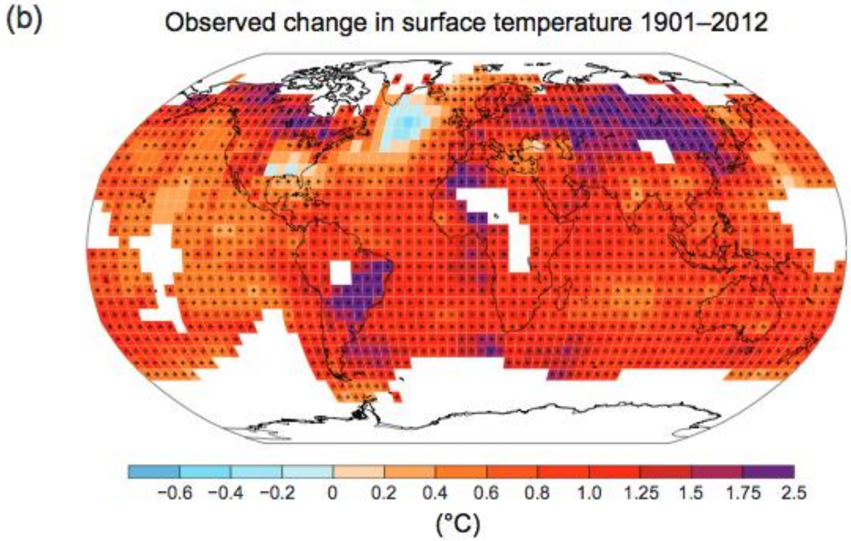
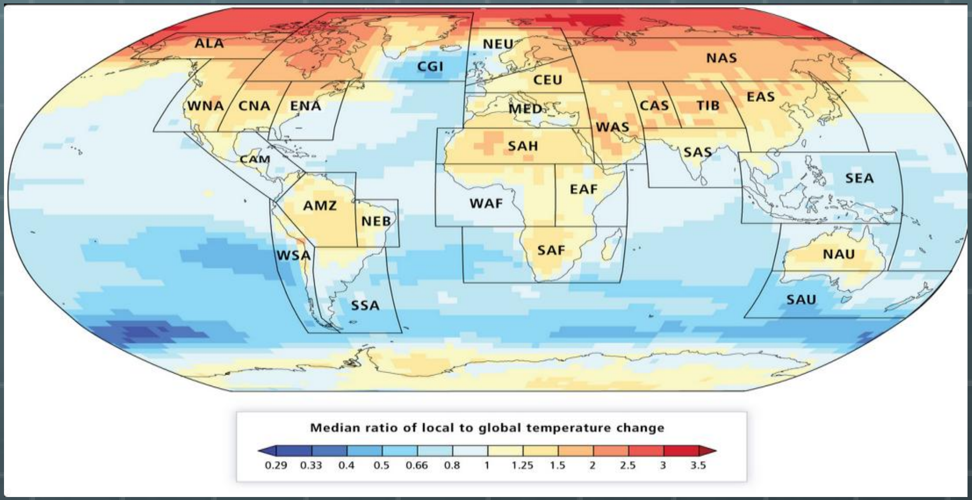


Figure SPM.1 | (a) Observed global mean combined land and ocean surface temperature anomalies, from 1850 to 2012 from three data sets. Top panel: annual mean values. Bottom panel: decadal mean values including the estimate of uncertainty for one dataset (black). Anomalies are relative to the mean of 1961−1990. (b) Map of the observed surface temperature change from 1901 to 2012 derived from temperature trends determined by linear regression from one dataset (orange line in panel a). Trends have been calculated where data availability permits a robust estimate (i.e., only for grid boxes with greater than 70% complete records and more than 20% data availability in the first and last 10% of the time period). Other areas are white. Grid boxes where the trend is significant at the 10% level are indicated by a + sign. For a listing of the datasets and further technical details see the Technical Summary Supplementary Material. {Figures 2.19–2.21; Figure TS.2}

IPCC, 2013: Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1–30, doi:10.1017/CBO9781107415324.004.

Northern latitudes and land are predicted to warm faster



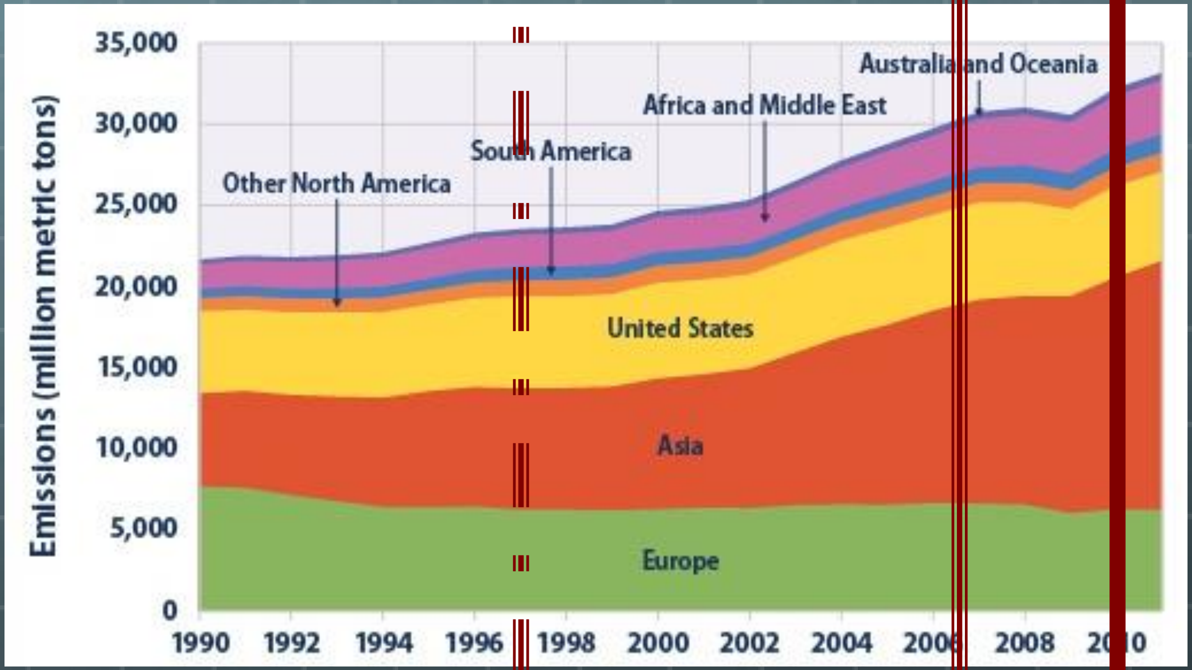
Source: IPCC WGII AR5 Chapter 21: Regional Context, p.1159

Median ratio of local to global average temperature change in the period 2071-2100 relative to 1961-1990 under representative pathway 8.5 RCP8.5 (2C rise by 2046-2065 and 3.7C by 2081-2100

International Policy since 1990

- Emission reductions large enough to keep the expected average planetary increase to 2 degrees centigrade (4.4 degrees Fahrenheit).
- This corresponds to an atmospheric concentration of greenhouse gas carbon-dioxide equivalents to 450 parts per million (ppm).
- Atmospheric CO2 concentration is now roughly 400 ppm, up from the pre-industrial level of 280 ppm.

Total anthropogenic GHG continue to rise



Source: US Environmental Protection Agency, Global Greenhouse Gas Emissions webpage. Data source: WRI 2014

EU: 40% below 1990 by 2030, 80% below by 2050

Kyoto

Country specific targets
-- Emission Trading
(regulatory policy)
-- Clean Development Mechanism 2001
(project based, innovation policy)
-- Joint implementation 2008

California:
1990 by 2020

California:
80% below 1990 by 2050

EU: 20% below 1990
By 2020

What would it take?

There is widespread agreement in the results from analysis using integrated assessment models (social and physical science)

- The models compute cost-effective pathways of socio-economic and energy systems under target constraints
- They show that stabilizing warming to 2-4 degrees centigrade requires near-zero emissions
- Both electrification of energy system AND decarbonization of electricity are required

But what does this imply logistically?

What would be the implied trajectory of carbon reduction in the power sector under stabilization targets ?

The answer requires assumptions:

- Timing and coordination
- Desirable uptake rates of new technologies
- Avoiding "lock-in"

Deep change in our daily activity

In order to reach 80% below 1990 levels by 2050, one analysis (UC Davis ITS, 2014) suggests examples such as:

- **40 % of fuel used by vehicles becomes biofuel**
- **59% to 89% of all electricity from non-hydroelectric renewable fuel power generation**

Why the focus on development-type policy?

- Logistical feasibility of these types of changes suggests policies aimed at encouraging innovation, and taking a “systems perspective” may ultimately be at least as efficient as regulatory policy.

Thank you for your attention !

You are invited to the up-coming

CARBON PRICING IN A COMPLEX ADAPTIVE SYSTEM

MERRITT HUGHES

Dissertation Proposal Defense

PhD Program in Public Policy

APRIL 30, 12:00 noon

INTEGRATED SCIENCE CENTER, RM 5300