Climate change and sustainable energy --

The environmental and social impacts of “low-carbon” energy

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Friends of the Earth International…

- is the world's largest grassroots environmental network
- uniting 71 diverse national member groups
- has some 5,000 local activist groups on every continent
- has about 1.5 million members and supporters around the world
- campaigns on today's most urgent environmental and social issues (IFIs, Trade, Climate Change, Forest, GMOs, Corporates)
- challenges the current model of economic and corporate globalization; and
- promotes solutions that will help to create environmentally sustainable and socially just societies

Our network and the struggle

Overview of the presentation

- Climate Change, the trends and the impacts
- The impacts of "low-carbon" energy: CDM/large-scale dam, biodiesel and natural gas
- Sustainable Energy

What happened?

We have been burning large amounts of fossil fuels like coal, oil and gas for almost 200 years. This has enabled us to build the modern societies that exist today.

www.oberlin.edu

Air Canada

www.ualberta.ca

However, what we didn't know was that along the way we have been creating the biggest problem that we have ever had...

…climate change!

NASA

Are we sure that the climate change is happening?

Yes! The most recent IPCC Working Group I report, ***The Physical Science Basis*** (Feb 2, 2007) concludes that:

- The observed increase in atmospheric concentrations of greenhouse gases since 1750 is the result of human activities
- The evidence for global warming, it states, is now "unequivocal" (clear or total)

So what?

- A greenhouse gas level of 650 parts per million (ppm) would "likely" warm the global climate by around 3.6°C, while 750 ppm would lead to a 4.3°C warming, 1,000 ppm to 5.5°C and 1,200 ppm to 6.3°C (IPCC)
- The world's average surface temperature has increased by around 0.74°C over the past 100 years (1906 - 2005)
- If atmospheric concentrations of greenhouse gases double compared to pre-industrial levels, this would "likely" cause an average warming of around 3°C, with a range of 2 to 4.5°C

It is happening now…

Climate change is not just a problem for future generations. **It's happening now!**

"…this is not science fiction; it is sober prediction, based on the best science available"

(UN Secretary General, Kofi Annan).

In Asia

- Tens of millions of people will be displaced as sea levels rise and if cyclone risk increases in low lying coastal areas.
- Forest fires, flooding and droughts could become more frequent

In Asia

In Asia

In Asia

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Preliminary findings on impact of climate change in Indonesia

- Disastrous impacts on the coastal areas (flood water fish area, saltwater intrusion, etc.)
- Loss of water resources **(IPCC WG2)**
- By 2080 parts of Sumatra and Kalimantan may be 10-30% wetter and Java and Bali may be drier by 15%
- Extreme weather events like El Niño are likely to be more severe and significantly increase the risk of forest fires **(CIFOR)**

www.uni-freiburg.de

In Africa

- Rising sea levels will cause large problems for coastal settlements particularly in the West African countries.
- Increases in droughts, floods and other extreme weather events will add to the current stress on water resources, food production and human health.

International Federation of Red Cross and Red Crescent Societies (IFRC)

NASA

In Australia and New Zealand

Fragile ecosystems such as coral reefs and alpine habitats could be destroyed.

MSNBCMedia

In Latin America

- Cycles of floods and droughts could become more frequent, degrading water quality.
- Stronger cyclones would destroy property and livelihoods.
- In new climatic conditions, deadly outbreaks of malaria, dengue fever and cholera could increase

In Small island states

- Even small rises in sea level rise will displace many indigenous people.
- There will be increased risk of storm damage by tropical cyclones.
- Vital freshwater resources are more likely to be contaminated by seawater

In polar regions

www.macysoft.com

- Polar ice caps will continue to melt and there will be massive coastal erosion.
- Once triggered these changes may continue to effect global weather patterns long after greenhouse gas levels have stabilised – leading to, for example, irreversible changes in ocean currents and ice-sheets

In Europe and North America

- In Europe half of alpine glaciers may be lost by the end of the century.
- Important habitats home to many species of rare plants and animals will be lost for ever.
- Coastal and river flooding will increase with impacts on people living in at risk areas.
- More hurricanes in UK and storms in Europe

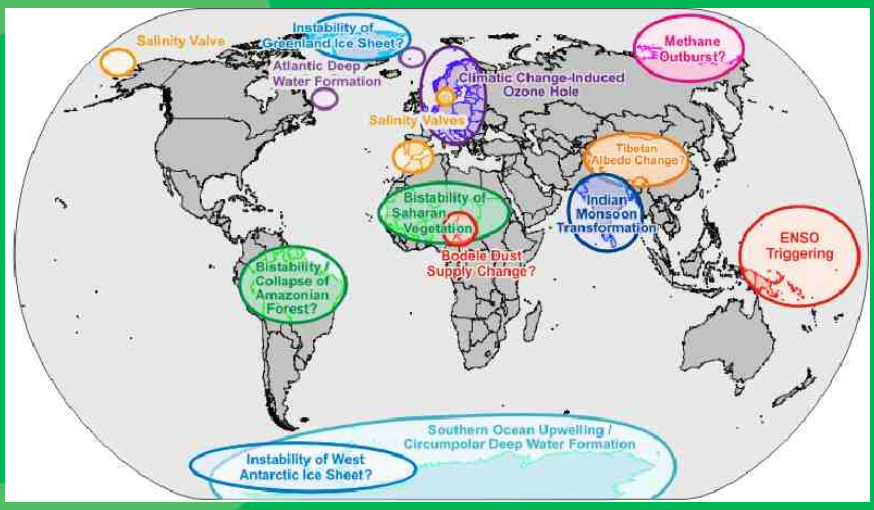
www.answer.com

AFP

Global impacts

- 150,000 people already die every year from climate change (**World Health Organisation**)
- The area of the world stricken by drought has doubled between 1970 and the early 2000s (**Greenpeace**)
- The economic costs of global warming are doubling every decade (**UN**)
- Up to a third of land-based species could face extinction by the middle of the century (**RSPB**)
- 100 million more people will be flooded by end of century (**FoE**)

Risks of sudden and unexpected system changes



Source: Schellnhuber 2003

Who will be affected the most

- The developed countries contain only a quarter of the world's population but are responsible for 60% of the greenhouse gas emissions (Japan with 2%of the world's population produces 5%of the world's C02)
- However the catastrophic results of climate change are expected to fall unequally upon developing countries and their inhabitants
- Worse still, developed countries with greater resources to deal with the effects of climate change have attempted to reduce their obligation to cut emissions of greenhouse gases at home. Instead they have negotiated to pay for emissions reductions in developing countries

But are we responsible?

The UN experts are confident that all these disastrous climatic changes are at least partly caused by human activity. **The report is certain that our dependence on burning fossil fuels is the dominant force behind the continuing rise in atmospheric carbon dioxide levels**

The prominent roles of the IFIs on the energy issue

- Amount of World Bank Group financing for fossil fuel projects, including extraction, power plants, and sector reforms, since Rio: **$28 billion**
- Frequency of approval of World Bank fossil fuel projects since Rio: **Once every 14 days**
- World carbon dioxide emissions from energy consumption, 2002: **24.5 billion tons**
- Lifetime carbon dioxide emissions (CO_2) from World Bank fossil fuel projects financed since Rio: **43.4 billion tons**
- Area of plantation forest required to sequester 43.4 billion tons of carbon dioxide in one year: **8.7 million square kilometers (an area of Brazil)**

The prominent roles of the IFIs on the energy issue

- Percentage of total World Bank oil projects for export to the North: **82**
- Percent commission that the World Bank proposed to charge for carbon trading in 1997: **5**
- Profit World Bank projected it would make from this commission by 2005: **$100 million**
- Ratio of World Bank fossil fuel to renewable energy and energy efficiency financing: **17 to 1**

Japan is the 5th biggest shareholder of the WB and the biggest shareholder of the Asian Development Bank

JBIC and Fossil fuel import in Japan

- JBIC is one of the world's largest International Financial Institutions
- In 2004 JBIC supported:
  - 14.7% of oil import in Japan
  - 94.2% of natural gas in Japan
  - 34.5% of coal in Japan

Key Extractive Industries Review (EIR) recommendations (2003)

- Cease lending for the oil sector by 2008 and continue the moratorium on lending for coal.
- Increase lending to renewable energy by 20 percent annually and lead in clean energy development globally.
- Adopt free, prior and informed consent so that affected communities and indigenous populations have a voice in development and decision-making.
- Recognize and adopt human rights and core labor standards.
- Recognize "no-go" zones for biologically and sociologically diverse areas and avoid funding projects in them.
- Transparency in revenue flows to companies, governments and communities

~~Other IFIs should follow the EIR recommendations~~

But the Bank refused it...

- Despite its mandate to promote renewable energy and reduce the impacts of climate change, it appears that the World Bank Group may be ill-suited to take on this important responsibility.
- The Bank continues to be focused on financing conventional energy projects that contribute to climate change, while taking only small steps in the direction of renewables and energy efficiency.
- The Bank is missing the tremendous opportunity that renewable energy presents. To address the issues of supplying energy for development without at the same time exacerbating climate change, the Bank must change the way it does business now, before it is too late

Let's demand

No more public money financing climate change!

So then what's the alternative?

The impacts of "low carbon" energy: Natural Gas

- Natural gas is considered cleaner than other fossil fuels because it produces the least amount of carbon dioxide per unit of energy when burned
- However, unburned, in its natural form of almost pure methane, it is many times more potent as a global warming agent than carbon dioxide
- Natural gas often leaks, unburned, from coal beds, gas installations, gas pipelines, and in oil prospecting
- Gas leakages such as these can more than nullify the benefits of relatively fewer greenhouse gas emissions when natural gas is burned.

The impacts of "low carbon" energy: Natural Gas

- Energy intensive (LNG)
- Often caused environmental and social conflicts in the field and in the pipeline:
  - controversy and allegations human rights abuses
  - construction of the pipeline the gas separation plant important areas forest)
  - inadequate Consultation
  - illegal takeover of land
  - potential to fuel conflict
  - gas Flaring

The Clean Development Mechanism (CDM)

- One of the project-based flexible mechanisms of the Kyoto Protocol
- designed to make it easier and cheaper for industrialised countries to meet the greenhouse gas (GHG) emission reduction targets that they agreed to under the Protocol
- The CDM is also mandated to assist developing countries in achieving sustainable development.
- Under the CDM, an industrialised country with a GHG reduction target (an Annex B country) can invest in a project in a developing country without a target (non-Annex B), and claim credit for the emissions that the project achieves.

CDM Hydropower

www.tufts.edu

www.eere.energy.gov

- Subsidizing large hydro is inconsistent with the CDM's mandate of promoting sustainable development
- As the World Bank/IUCN-sponsored World Commission on Dams has shown, large hydro projects have seriously negative social and environmental impacts and have regularly underperformed
- In addition, large hydro projects are especially prone to be non-additional.
- Furthermore, evidence continues to mount that reservoirs can be a significant source of greenhouse gases

The rapidly increase biodiesels demand will lead to:

- increased land competition leading to further land concentration, the marginalization of small-scale agriculture and the widespread conversion of forests and other ecosystems;
- arable land that is currently used to grow food being used to grow fuel, leading to staggering food prices and causing hunger, malnutrition and impoverishment amongst the poorest sectors of society;

The rapidly increase biodiesels demand will lead to:

- rural unemployment and depopulation;
- the destruction of the traditions, cultures, languages and spiritual values of Indigenous Peoples and rural communities;
- the extensive use of agro-chemicals, which deteriorate human health and ecosystems
- the destruction of watersheds and the pollution of rivers, lakes and streams;
- droughts and other local and regional climatic extremes; and
- the extensive use of genetically modified organisms leading to unprecedented risks

Urgent actions are needed

- Climate change is the most pressing global environmental problem facing humanity
- Hundreds of millions of people could lose their livelihoods or lives if average global temperatures rise by more than 2°C
- Up to one million species could go extinct

This outcome is almost inevitable if global emissions do not start to fall within the next 20 years

Mandatory actions are needed

Without urgent action, climate change will devastate life on earth. Hundreds of millions of people, particularly the world's poorest and most vulnerable, will be put at severe risk of drought, floods, starvation, and disease. **By the middle of the century up to one third of land-based species could face extinction**

If we are to avoid catastrophic climate change

- We need to cut our emissions of greenhouse gases, and keep the average global temperature increase under 2°C
- Capping the rise in average global temperatures doesn't mean that we won't see any harmful impacts, but a 2°C limit will keep them to a minimum.
- To stay within this limit, global greenhouse gas emissions must peak and be falling irreversibly by 2015
- Therefore the choices made now and in the next five to ten years, by politicians and decision makers, will determine the extent of the devastation faced by future generations

So far...

- Politicians have failed to take sufficient action to avoid exceeding this 2°C limit
- Legally binding national targets for reducing greenhouse gas emissions are the only way of meeting the global 2015 target, as well as holding world leaders to account over taking the necessary action.

So, what needs to be done?

- Firstly we must recognise that climate change is a problem that we can tackle
- Friends of the Earth International believes urgent action is required on an international scale to reduce emissions drastically in the next few decades
- Governments must first commit to the Kyoto Protocol and then agree reductions of CO2 emissions by 60 – 80 % globally by 2050. Rich countries must face the biggest cuts.
- We need to switch our dependence on fossil fuels to renewable energy sources
- The large international development banks (WB, ADB, etc.) must stop financing fossil fuel projects and start backing renewable energy

Change the lifestyle

"The key is actually discarding the idea that has dominated economic policy making, which is: in order for a country to get rich, stay rich and get richer, you have to put more greenhouse gases in the atmosphere. That isn't true and it hasn't been true for years"

(Former US President Bill Clinton)

Solutions

- There are many solutions to climate change
- Fundamental to any credible solution is the need to cut our emissions by reducing our demand for energy and improving the energy efficiency of our technology
- We also need to promote renewable energy sources

- Lighting an average office overnight wastes enough energy to heat water for 1,000 cups of tea (BBC).
- A PC monitor on standby uses 51kWh per year of electricity (equivalent to 500 boiling kettles) (BBC).
- Two photocopiers and three printers switched off saves around five tones of CO2 per year (BBC).

Sustainable and renewable anergy

- Transform the global energy system away from one dependent on fossil to one that is based on new renewables and energy efficiency
- Create a special focus and programme for delivering appropriate clean and affordable energy services for the 2 billion people who are without these energy services as a key element to achieving the Millennium Development Goals (MDGs)

Sustainable and renewable anergy

- Renewable energies can significantly contribute to sustainable development and to providing access to energy, especially for the poor
- They will contribute to the to mitigation of greenhouse gas emissions, reducing harmful air pollutants
- Creating new economic opportunities, and enhancing energy security through cooperation and collaboration.

www.myanmar.gov.mm

www.iitb.ac.in

Micro hydro-power

www.ashdenawards.org

- up to 100 kilowatts of electricity
- one of the most effective means of producing off-grid electricity for rural communities, particularly in mountainous areas
- proper application of a micro-hydro plant can reduce poverty, increase education, and promote economic growth in an environmentally responsible way.
- the cost per installed kW ranged from US$714 to US$2,133 – about 5 to 18 times less than a comparable photovoltaic system

Solar photovoltaic (PV) systems

- turn sunlight directly into energy, are particularly useful for rural electrification in areas not well-suited for micro-hydropower
- can be used for electricity, water pumping and treatment, health care
- monthly cost of a photovoltaic solar home system (SHS) to be around US$10 –

www.greenfield-hydroponics.com

www.greenstar.org

www.ecohaus.com

Wind energy

- a viable source for off-grid applications
- community wind systems that are linked to generators and small wind turbines linked to batteries are good options in rural areas with certain wind conditions.
- generally a cheaper option than solar power in locations with average windspeeds larger than four meters per second during the least windy times

Modern and small-scale biogas and biodiesel

- Produced from plants that can be used in much the same way as natural gas or gasoline
- When biofuels are produced and used locally, biofuels can also help local economies:
  - from native plants
  - from plants that grow without fertilizer
  - do not need irrigation
  - for local use can produce significantly fewer emissions than conventional gasoline

Conclusions

- End public subsidies for fossil fuels
- Step up efforts to meet the basic energy needs of the poor
- Redirect existing dirty energy financing to renewable technologies and energy efficiency project via an appropriate multilateral framework agency
- Adopt progressive target for greenhouse gas emission reductions

The future is sustainable energy