

## **Ten key findings of the IPCC Working Group 3 report on climate mitigation**

Working Group 3 of the Intergovernmental Panel on Climate Change published its report on mitigation options for climate change on April 13<sup>th</sup>. This short briefing identifies ten of the key findings published within the Summary for Policy Makers (SPM). Most notable is the need to rapidly reduce emissions for fossil fuels (dirty energy).

### **Development**

1. We are on a path towards 3.7 – 5.8 degrees of global warming by the end of the century. The earlier Working Group 2 report identified that even 2 degrees of warming will have significant negative impacts on food production, water availability and extreme weather events, particularly affecting the poorest in the world. Around a third of wildlife species would also be under threat of extinction. Four degrees of warming would be devastating<sup>i</sup>.
2. About 1.3 billion people worldwide do not have access to electricity and about 3 billion are dependent on traditional solid fuels for cooking and heating with severe adverse effects on health, ecosystems and development. Providing modern energy services is necessary and will have minimal effects on greenhouse gas emissions.

### **Avoiding dangerous climate change**

3. A limited number of scenarios suggest it is possible to reduce greenhouse gas emissions sufficiently to give a greater than 50% chance of avoiding 1.5 degrees warming. The IPCC says to do so requires immediate mitigation action; the rapid up-scaling of the full portfolio of mitigation technologies; and development along a low-energy demand trajectory. Scenarios that give greater than 50% chance of avoiding two degrees of warming are characterized by reductions in CO<sub>2</sub> from energy supply of 90% or more below 2010 levels between 2040 and 2070. Emissions in many of these scenarios are projected to decline to below zero thereafter.
4. Bio-energy has an important role - it is particularly identified as necessary in pathways to keep below 2 degrees warming - both as a source of energy but also coupled with carbon capture and storage to remove carbon dioxide from the atmosphere (negative emissions). However the report points out that large-scale deployment of bioenergy can lead to concerns about GHG emissions from land, food security, water resources, biodiversity conservation and livelihoods.

### **Spending on low carbon energy**

5. The earlier Working Group 2 report identified that developing countries required significant funds to adapt to the climate change that is already underway. A global estimate of adaptation costs of \$100 billion per year by 2050 was provided with the proviso that this is likely to be a gross underestimate as it didn't take into account

impacts from extreme weather or on ecosystem services. In addition to this, the Working Group 3 report said some studies suggested substantial global financial flows were necessary for mitigation in scenarios with low levels of global warming. There is likely to be details on amounts within the chapters of the WG3 report.

6. The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are \$72 to \$95 billion per year until 2030. They will yield large health benefits.
7. A rapid shift in funding towards energy efficiency and low carbon energy is necessary. The report states that over the next two decades investment in energy efficiency in transport, buildings and industry should increase by \$336 billion per year, investment in low carbon energy should double to around \$300 billion a year and investment in fossil fuel electricity supply should decline by around \$30 billion to around \$100 billion.

### **Political and economical considerations**

8. The emission reduction pledges for 2020 made by governments at the Cancun international climate talks are not consistent with cost-effective pathways commensurate with even a 50% chance of avoiding 2 degrees warming (although they do not preclude meeting this goal). Yet there are significant co-benefits of the 1.5 to 2 degree mitigation scenarios, including reduced policy costs for achieving air quality and energy security objectives, and co-benefits for human health, ecosystem impacts, and sufficiency and resilience of the energy system
9. Very minor consumption losses (GDP) due to mitigation action on climate change are identified but these should be seen in a context of consumption expected to grow 300-900 per cent from current levels over the same time period. Also these losses do not consider the benefits from mitigation, including avoiding impacts from extreme weather or co-benefits for health (e.g. reduced air pollution from coal-fired power stations). The consumption loss associated with below 2 degree scenarios is around 3.5 per cent by 2050 and 5 per cent by 2100.

### **Technology**

10. Fossil fuels are responsible for three-quarters of greenhouse gases. The report suggests that a wide-array of technologies need to be deployed to reduce emissions from fossil fuels. Without some technologies – notably bioenergy and CCS - the report says that the lowest temperatures may not be achievable. They warn about locking-in emissions through development of high emissions technology, although they do suggest gas has a role in replacing coal-fired power stations, providing fugitive emissions from extraction and supply are low. Gas use with CCS would have to decline after 2050. Behaviour change – e.g. in transport, diet – will also be necessary they say.

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<sup>i</sup> Friends of the Earth (2014), Climate Change, poverty and environmental justice – what the IPCC scientists say about climate impacts <http://www.foe.co.uk/sites/default/files/downloads/climate-change-poverty-environmental-justice-46180.pdf>