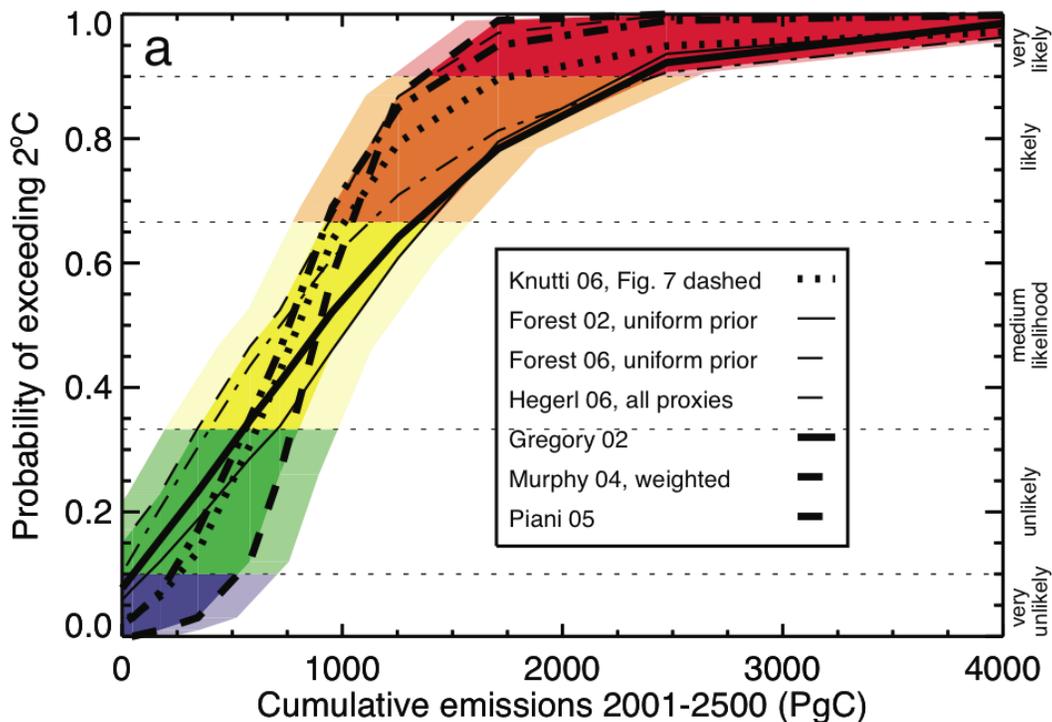


6. Urgent Action Needed to Avoid a 2 Degree Centigrade Increase in Average Global Temperature and the Dangers That Come With It

Kirsten Zickfeld has worked to analyze what the world must do to avoid a 2 degree rise in average global temperatures – in other words, to avoid dangerous manmade interference with the global climate system. She explained to the Citizens' Hearings that **it is the accumulated emissions of carbon dioxide over time that will largely determine the surface warming of the Earth in this century and beyond.**

Kirsten presented a summary of her 2009 work on this topic. She explained that very deep reductions in fossil fuel use are required in order to keep cumulative carbon emissions below the levels necessary to avoid dangerous climate change. She stressed that it is important to go to zero human induced carbon dioxide emissions as soon as possible, in order to avoid the risk of crossing dangerous climate thresholds. She emphasized that **only a small fraction of current known fossil fuel reserves can be allowed to be developed and used if dangerous climate change is to be avoided.**

Probability of exceeding 2° C target



Global carbon budget for $p < 0.33$: 590 GtC

Zickfeld et al., 2009

GRAPHIC PRESENTED AT THE HEARINGS BY DR. KIRSTEN ZICKFELD

Peter Prebble summarized for the Hearings the recently published work by the Intergovernmental Panel on Climate Change on this topic. IPCC scientists have reached a consensus that if the global community wants to have at least a 66% chance of avoiding dangerous climate change, it must ensure that a total of no more than 790 billion tonnes of human induced carbon is released into the atmosphere by human activity. (This estimate also takes account of methane and nitrous oxide concentrations in the atmosphere.) As of 2011, an estimated 515 billion tonnes had already been released. **Based on this IPCC analysis, that means that our global upper remaining limit is only another 275 billion tonnes of carbon.**

In the calendar year 2011 alone, 10.4 billion tonnes of carbon was released into the atmosphere from fossil fuel burning, cement production, deforestation and other land use change. **If this rate of carbon release continues, the global community will use up its entire carbon budget within another 25 years.** If the governments and people of the world wanted to achieve an even higher probability of avoiding dangerous climate change, then the time period before the carbon budget is used up would become even shorter.

This IPCC analysis once again suggests that exceptionally deep cuts in the use of fossil fuels are needed as quickly as possible. Darrin Qualman noted that accomplishing such a transformation of our energy systems and related infrastructure will take decades, so this work must begin immediately. In effect, the world only has 25-30 years to completely change our civilization's heavy reliance on fossil fuels.

In light of the carbon budget realities we face, Mark Bigland-Pritchard proposed that developed countries must provide major leadership in combating climate change starting immediately. He suggested that developed countries should set a 2020 target of reducing greenhouse gas emissions at least 40% below 1990 levels. He cited an extensive analysis by senior Tyndall Centre scientists Kevin Anderson and Alice Bows (2011) which demonstrates that this is the scale of reduction required to give the international community a passable chance of staying below a 2 degree Centigrade global average temperature increase. Large annual reductions in emissions will also be needed by developing countries if the 2 degree Centigrade limit is to be achieved. (Refer to "Beyond 'dangerous' climate change: emission scenarios for a new world" by Anderson & Bows).