

Negative Emissions Technologies (NETs) Curse or Salvation?

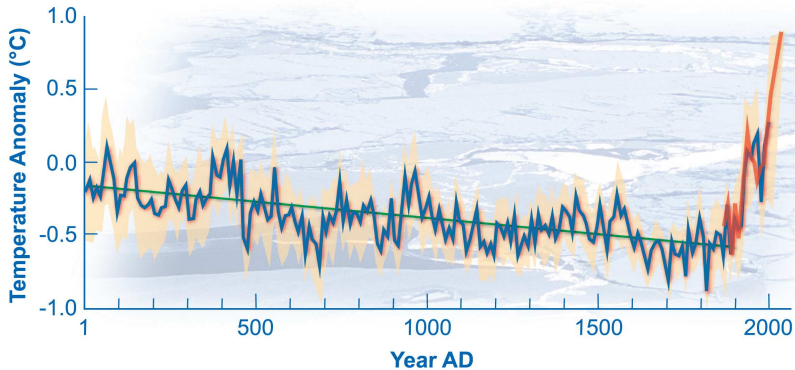
Barry McMullin
barry.mcmullin@dcu.ie

School of Electronic Engineering
Dublin City University

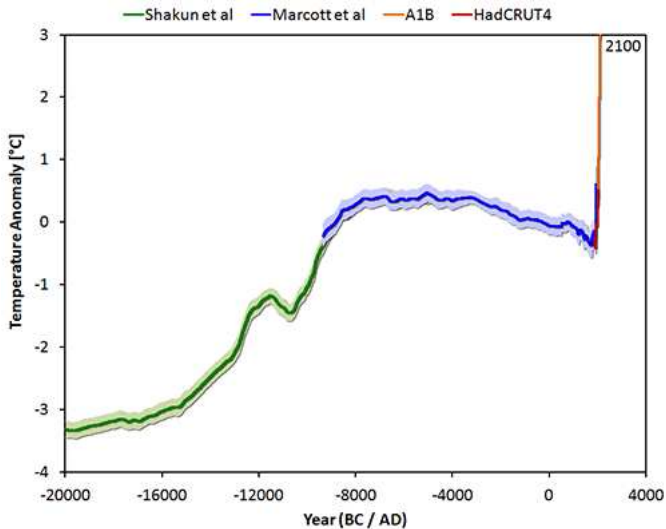
Feasta Workshop
Rossbeigh, Co. Kerry
29th June 2017

(Beamer Presentation)

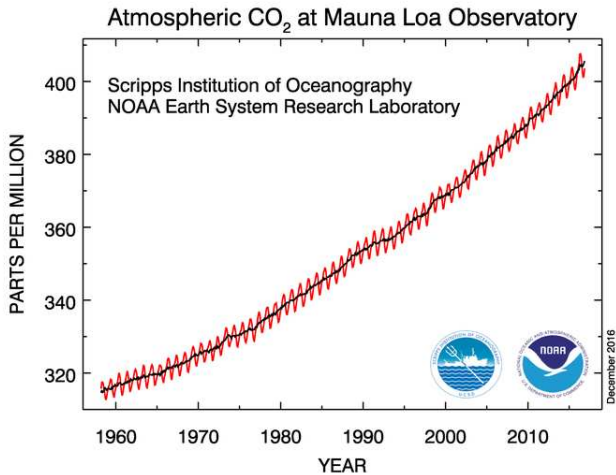
Context: Climate Change is *Real*



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Context: the cause really is “us” ...



Context: and yes, it really is *serious*

 **Guardian Environment** ✓
@guardianeco

Following

Climate change will stir 'unimaginable' refugee crisis, says military



theguardian

Climate change will stir 'unimaginable' refugee crisis, says military
Unchecked global warming is greatest threat to 21st-century security where mass migration could be 'new normal', say senior military
theguardian.com

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6:01 AM - 1 Dec 2016

2 108 47 ***

The Paris agreement: “Mischief Managed” ?



COP21: UN chief hails new climate change agreement as 'monumental triumph'



Secretary-General Ban Ki-moon (second left), UNFCCC's Christiana Figueres (left), French Foreign Minister Laurent Fabius and President of the UN Climate Change Conference in Paris (COP21), and President François Hollande of France (right), celebrate historic adoption of Paris Agreement. UN Photo/Mark Garten

Trump negotiates?



Follow

Trump To Directly Negotiate With The Climate
To Ensure It Doesn't Change
waterfordwhispersnews.com/2016/11/21/tru

...



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9



93



130



Danny Healy-Rae proposes decisive action



Danny Healy Rae Suggests Leaving Child Of Prague Under Bush To Combat Climate Change

waterfordwhispersnews.com/2016/05/05/dan... #news



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1:00 PM - 5 May 2016

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Denis Naughton says “get real”



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“Look, our 2020 targets were virtually unachievable when they were signed up to in the first place...”



Interview: Denis Naughton has his work cut out with tricky portfolio

Minister for Communications, Climate Action and Environment seeks to make online TV viewers pay

irishtimes.com

11:08 AM - 2 Dec 2016



But: Physics is implacable



Glen Peters

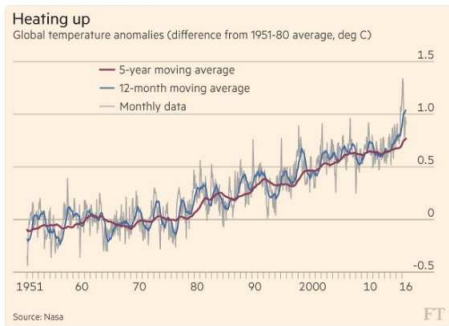
@Peters_Glen



Follow

It is too easy to applaud what are little more than gestures in tackling climate risks as if they are the real thing

buff.ly/2eezePG



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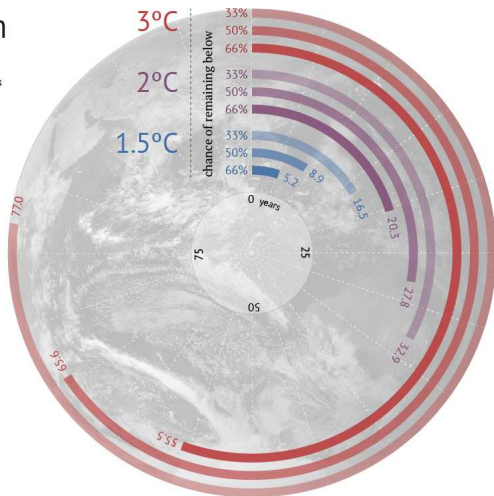


8:19 AM - 3 Nov 2016

The core problem: the atmosphere is (very nearly) “full”

Carbon Countdown

How many years of current emissions would use up the IPCC's carbon budgets for different levels of warming?



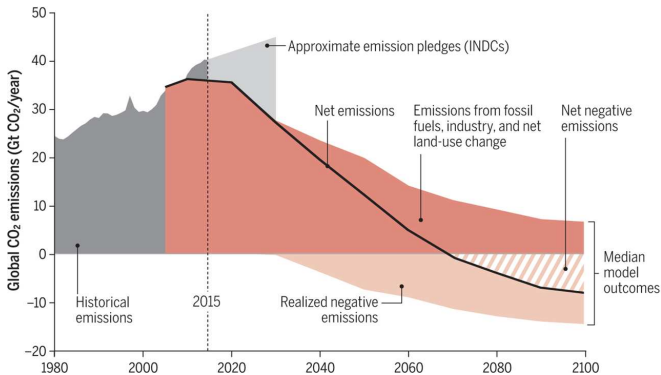
CarbonBrief
CLEAR ON CLIMATE

Photo credit: NASA Goddard Space Flight Center
Stopwatch icon: T-Kot/Shutterstock.com

But at least NETs mean we do have plenty of time?

No quick fixes

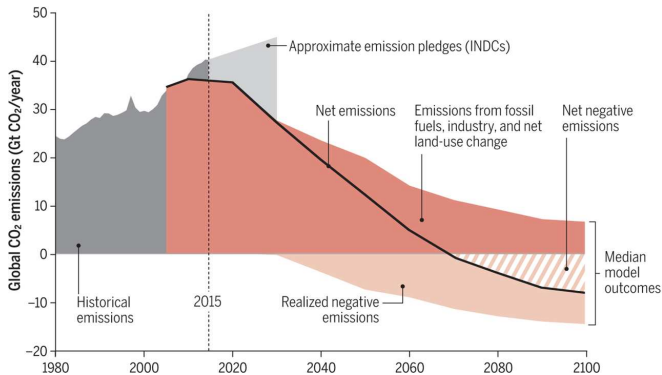
Modelers generally report net carbon emissions, unintentionally hiding the scale of negative emissions. Separating out the positive CO₂ emissions from fossil fuel combustion, industry, and land-use change reveals the scale of negative CO₂ emissions in the model scenarios (16). INDCs, Intended Nationally Determined Contributions.



But at least NETs mean we do have plenty of time? NOT!

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So what *are* these “NETs”?

- Bioenergy with carbon capture and storage (BECCS)
- Afforestation/Reforestation (AR)
- Increased soil carbon storage (SCS)
- Biomass to Biochar
- Direct Air Capture (DAC)

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The IE-NETs research project

- EPA funded (grant reference 2016-CCRP-MS.36)
- Two year “medium scale study”: 2017/2018
- Collaboration between DCU and TCD (Prof. Mike Jones)
- Focus on potential *within Ireland* ...
- ... to increase Irish “carbon budget” (phew?)
- Website (preview): ienets.eeng.dcu.ie

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But: beware of “magical thinking”

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“Negative-emission technologies are not an insurance policy, but rather an unjust and high-stakes gamble. There is a real risk they will be unable to deliver on the scale of their promise. . . . This is not to say that they should be abandoned. They could very reasonably be the subject of research, development, and potentially deployment, but . . .

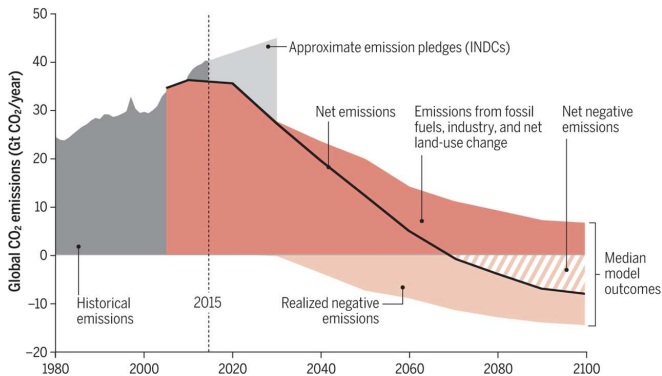
But: beware of “magical thinking”

*“Negative-emission technologies are not an insurance policy, but rather an unjust and high-stakes gamble. There is a real risk they will be unable to deliver on the scale of their promise. . . . This is not to say that they should be abandoned. They could very reasonably be the subject of research, development, and potentially deployment, but **the mitigation agenda should proceed on the premise that they will not work at scale.**”*

But: beware of “magical thinking”

No quick fixes

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Who is at risk? And who chooses?

*“The appropriateness or otherwise of relying, in significant part, on negative-emission technologies to realize the Paris commitments is an issue of risk. However, the distribution of this risk is highly inequitable. **If negative emission technologies fail to deliver at the scale enshrined in many [assessment models], their failure will be felt most by low-emitting communities that are geographically and financially vulnerable to a rapidly changing climate.**”*

— Kevin Anderson, Glen Peters, *Science*, October 2016

Finally: Curse or Salvation?

“It is clearly less risky not to emit a tonne of CO2 in the first place, than to emit one in expectation of being able to sequester it for an unknown period of time, at unknown cost, with unknown consequences, at an unknown date and place in the future.”

– Rob Bailey, Chatham House (Carbon Brief 2016)

Reflections, Questions, Discussion?

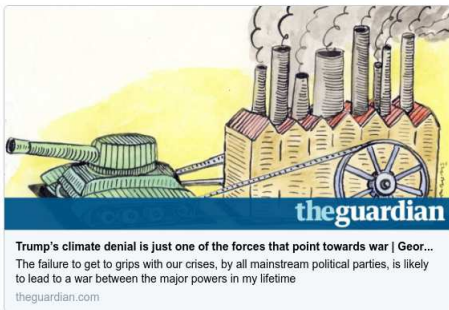
Parting Thoughts...



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(Faced with escalating geopolitical risk, prudent nations will re-focus on securing Maslow's "basic" human needs.)



12:07 PM - 24 Nov 2016



Parting Thoughts...



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@autofac

That is: Food, water, warmth, rest, security, safety. simplypsychology.org/maslow.html
Funnily enough, not "economic growth".

autofac @autofac

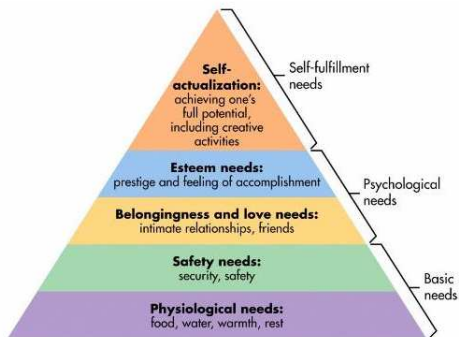
(Faced with escalating geopolitical risk, prudent nations will re-focus on securing Maslow's "basic" human needs.) theguardian.com/commentisfree/...

1:12 PM - 24 Nov 2016



Maslow's Hierarchy of Needs

by Saul McLeod published 2007, updated 2016



The Locust Years

Owing to past neglect, in the face of the plainest warnings, we have now entered upon a period of [great] danger . . . The era of procrastination, of half-measures, of soothing and baffling expedients, of delays, is coming to its close. In its place we are entering a period of consequences.

I never would have believed that we should have been allowed to go on getting into this plight, month by month and year by year, and that even the Government's own confessions of error would have produced no concentration of Parliamentary opinion and force capable of lifting our efforts to the level of emergency. I say that unless the House resolves to find out the truth for itself it will have committed an act of abdication of duty without parallel in its long history.

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— Winston Churchill, House of Commons, 12 November 1936.

(The “afterword” ...)

Note for readers: if reviewing these slides after the presentation at the Feasta workshop, note that there are links to further information online interspersed throughout. In particular, many of the images are clickable links to more detailed background.

Enjoy! - Barry.