Climate Change

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ACKNOWLEDGEMENT: ROD ORAM

St. Matthew in the City
September 10, 2017

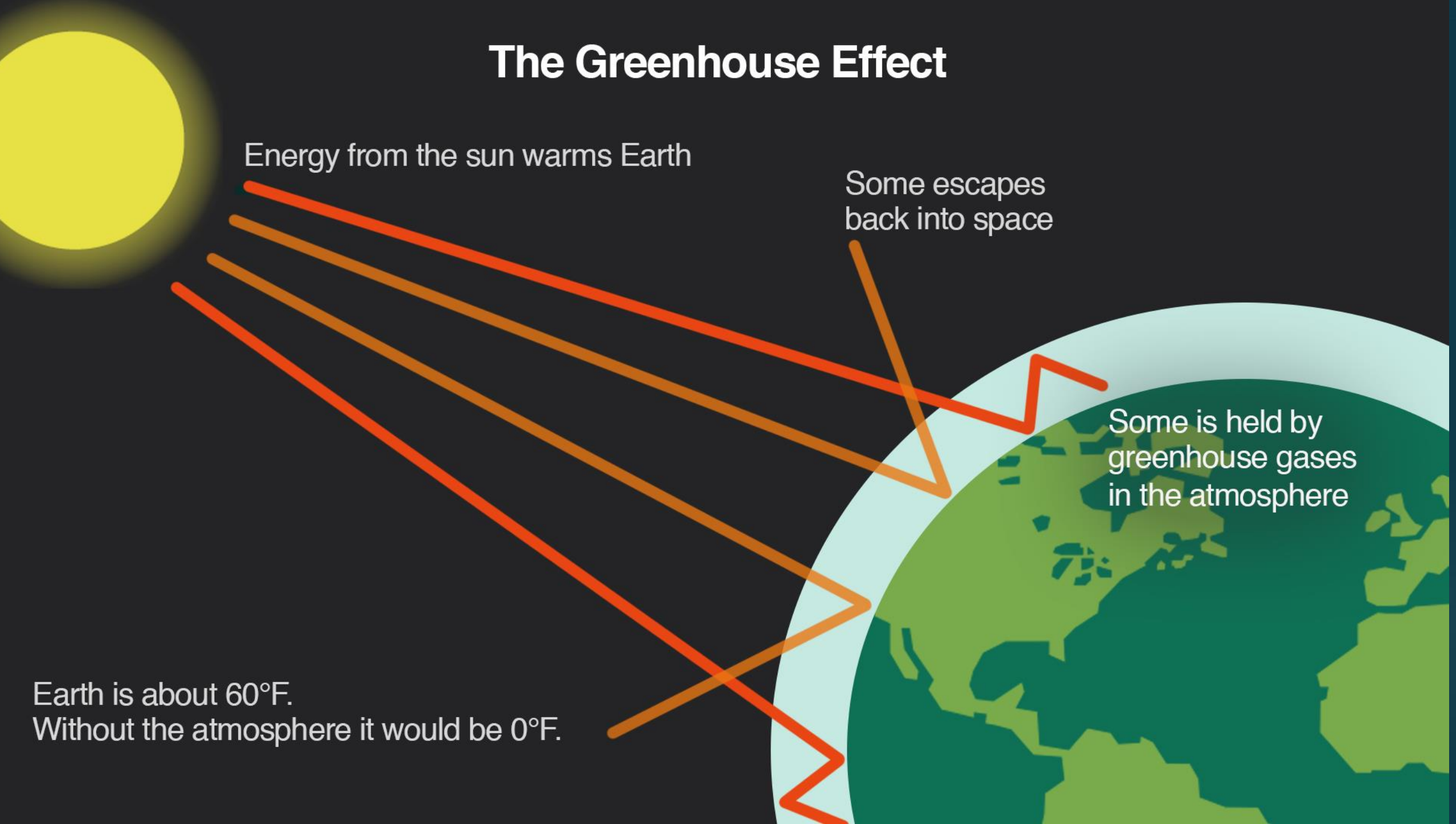
What is climate change?

- And what about greenhouse gases?

CLIMATE is the average of many years of weather observation.

Tropical
Temperate
Mild
etc

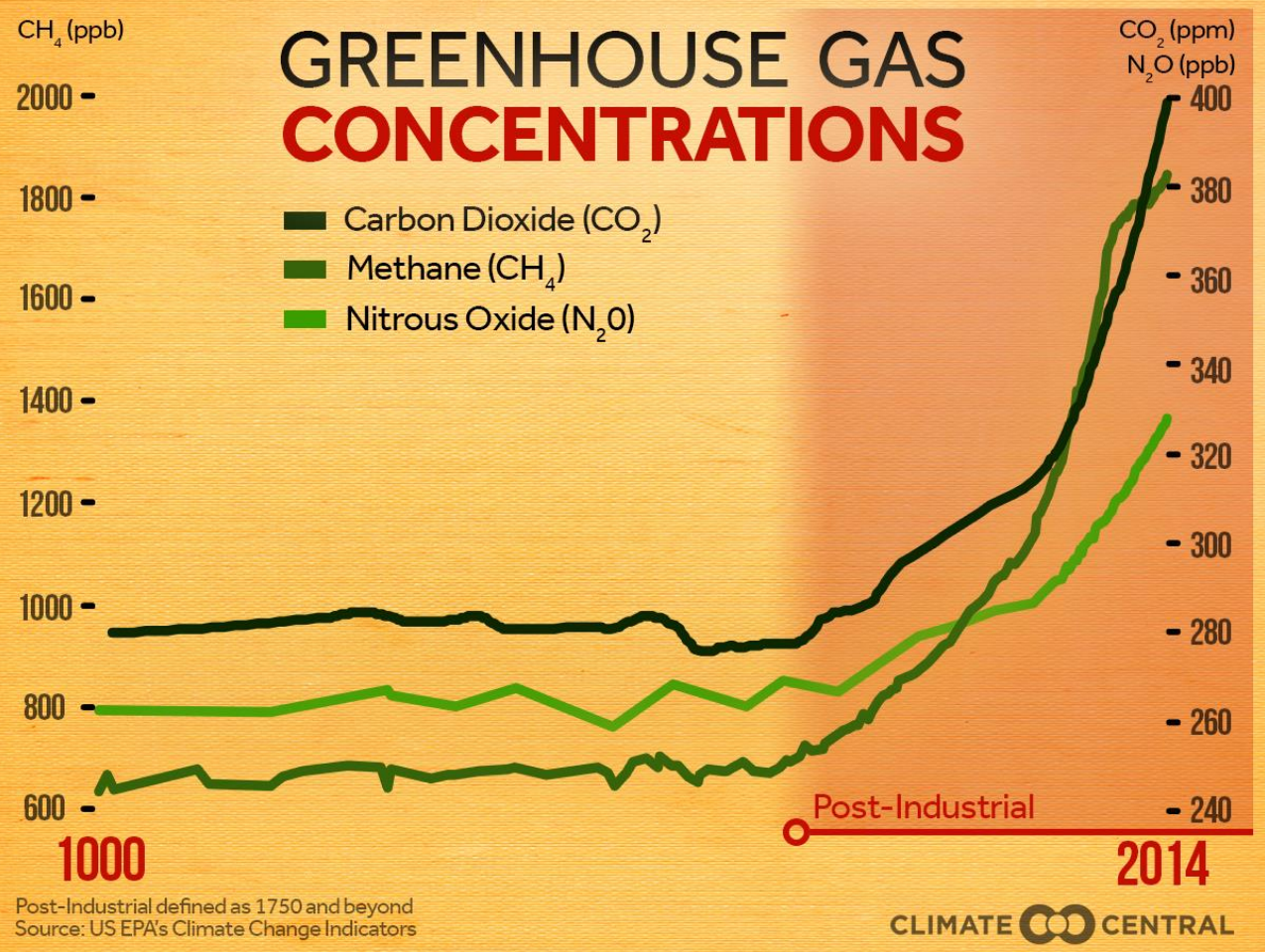
The Greenhouse Effect



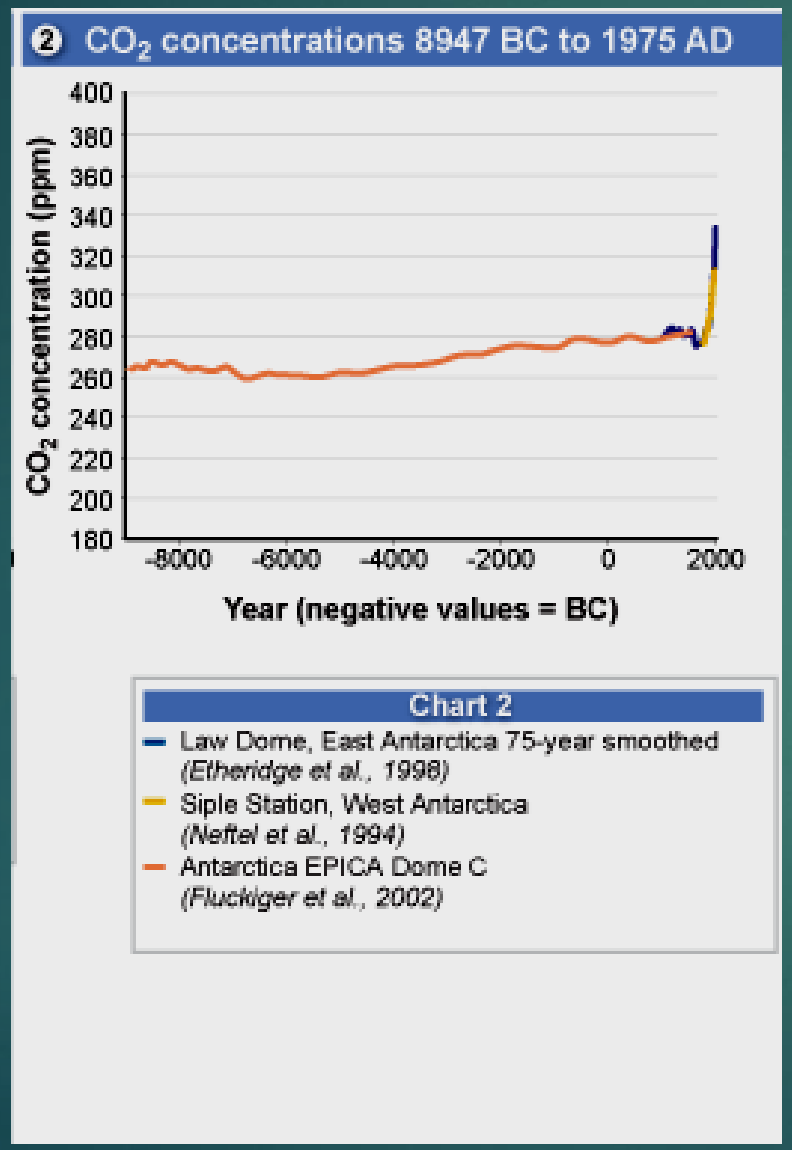
Carbon Dioxide (CO_2)

In the distant past, the Earth was much warmer. High levels of carbon dioxide in the atmosphere fueled lush growth, some of which was stored in the form of fossil fuels.

Industrial Revolution jump in carbon emissions



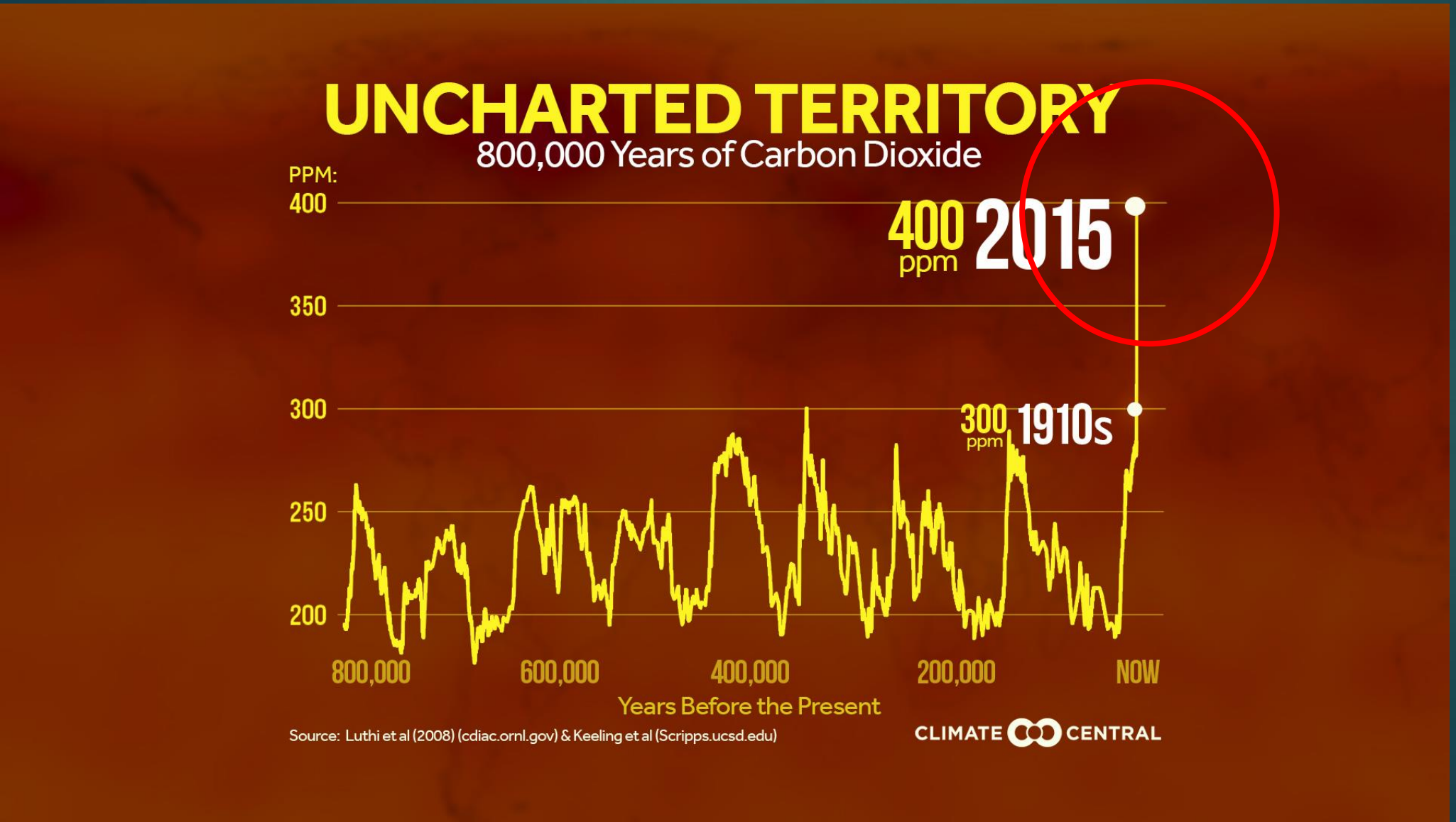
- Sharp increases in these heat-trapping gases since the Industrial Revolution



Carbon Dioxide in Earth's atmosphere has risen by about 30% since the beginning of the industrial revolution. Most of the increase is due to the combustion of fossil fuels, which releases the long-stored CO_2 back into the atmosphere.

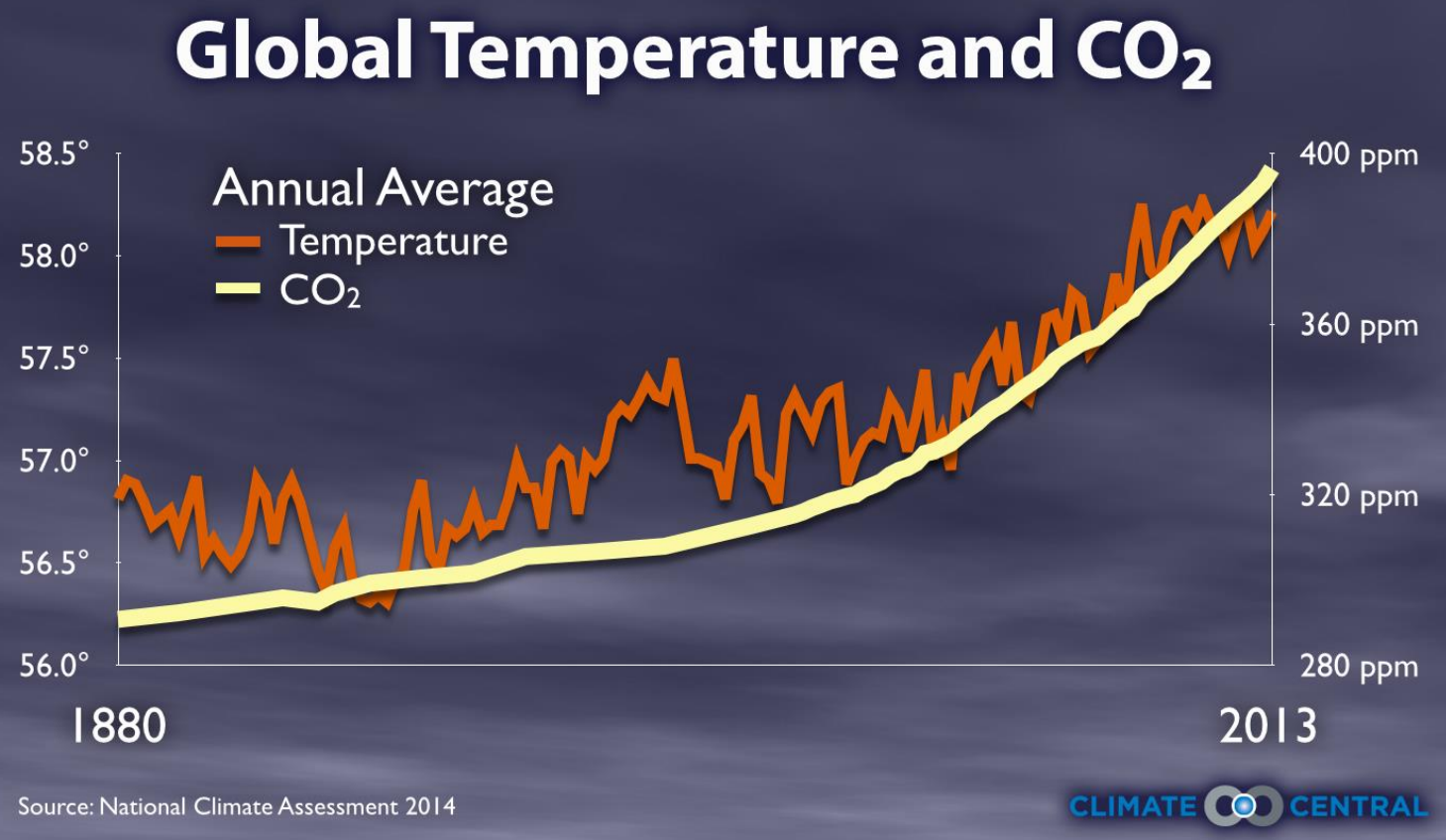
www.epa.gov/climatechange

Science: Reconstructing the Past



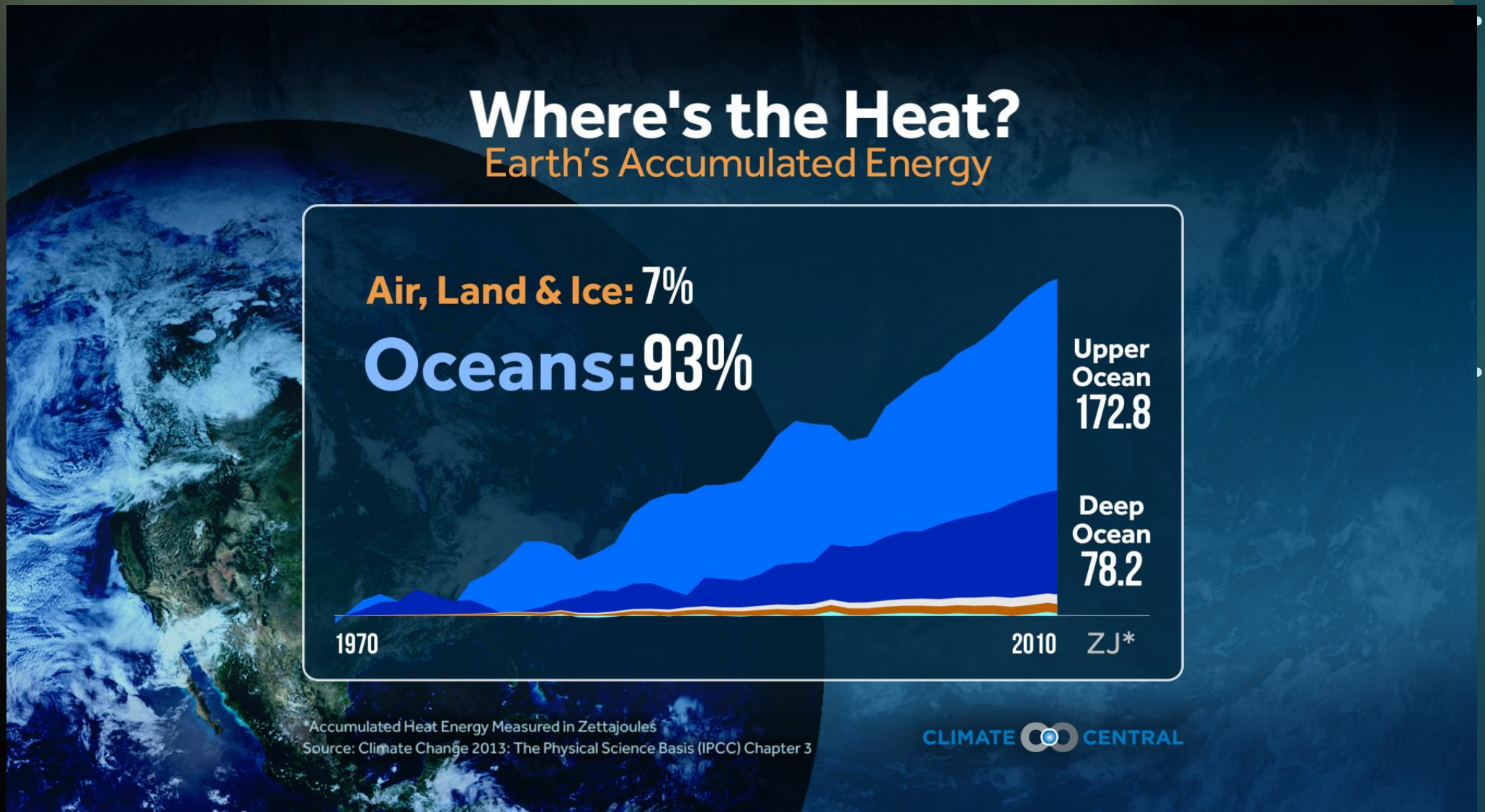
- Some studies suggest highest level in 2 million years

Indicators: Hotter Times Have Arrived



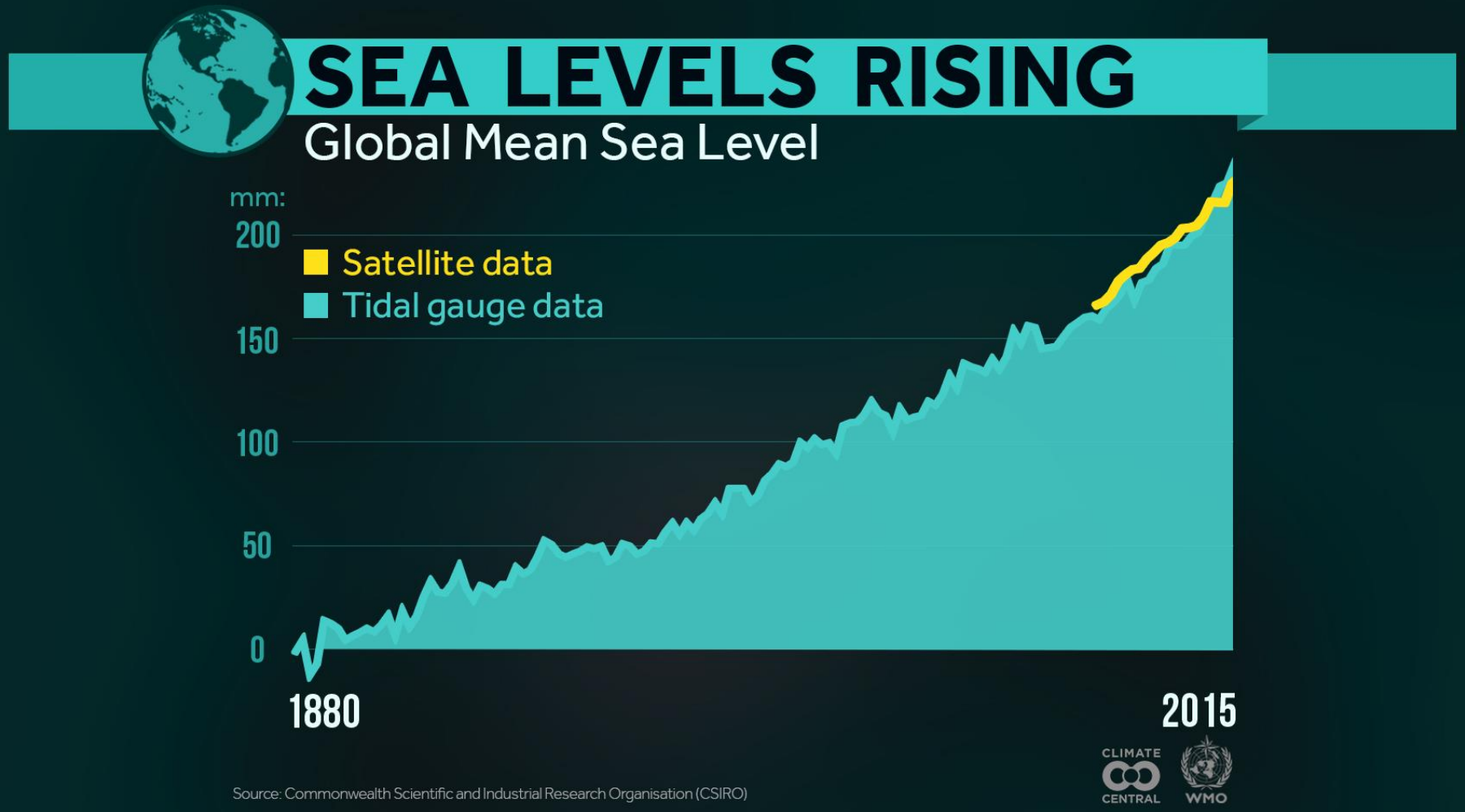
- Trends in CO_2 and global temperatures are closely related

Indicators: Hotter Times Have Arrived



- 2015: 39th consecutive year global temperature was above average
- More than 100 years since Earth has had a record cold year

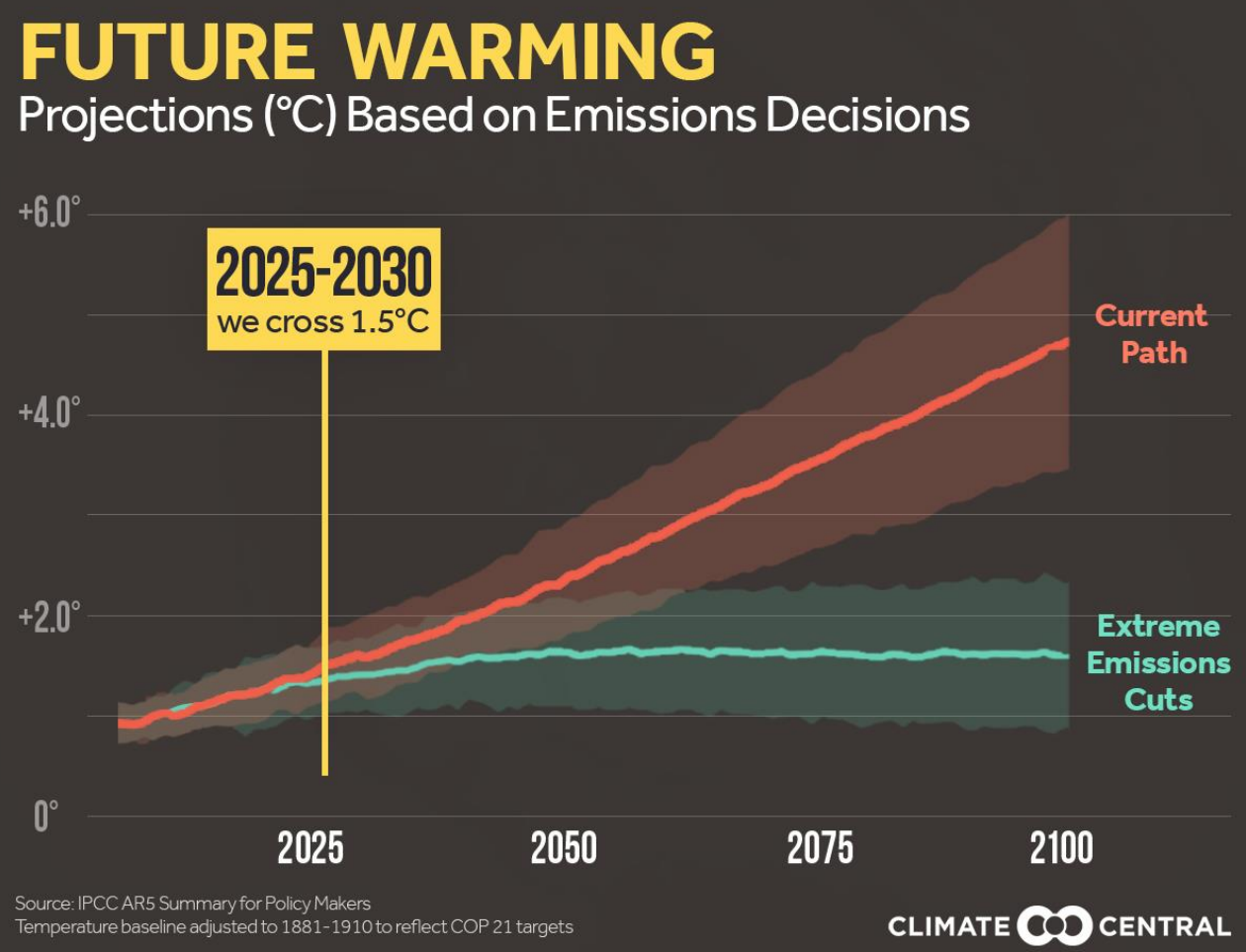
Indicators: Sea Levels Are Rising



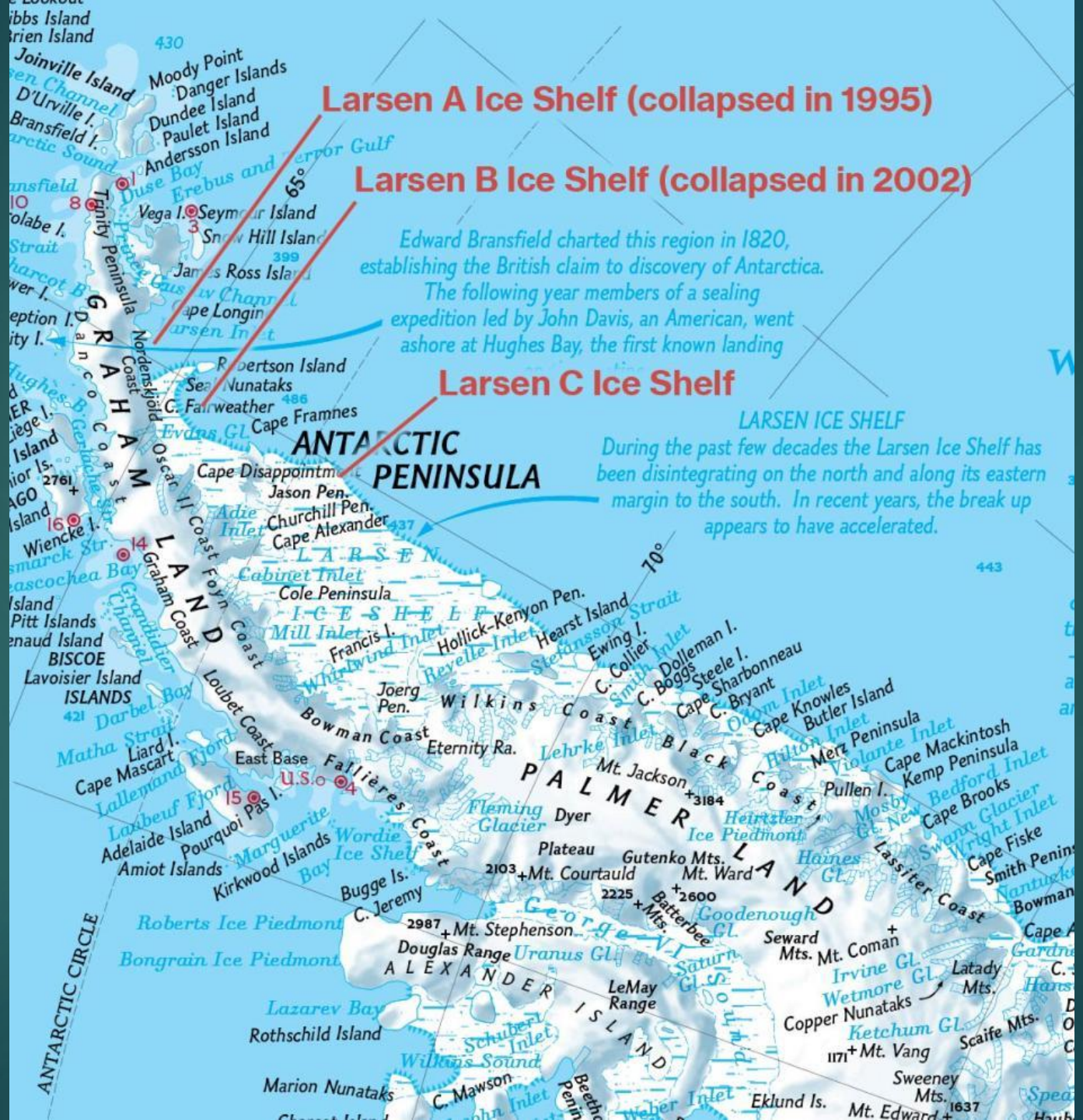
Caused by:

- Warm, expanding waters
- Melting ice sheets (Antarctica, Greenland)
- Melting glaciers

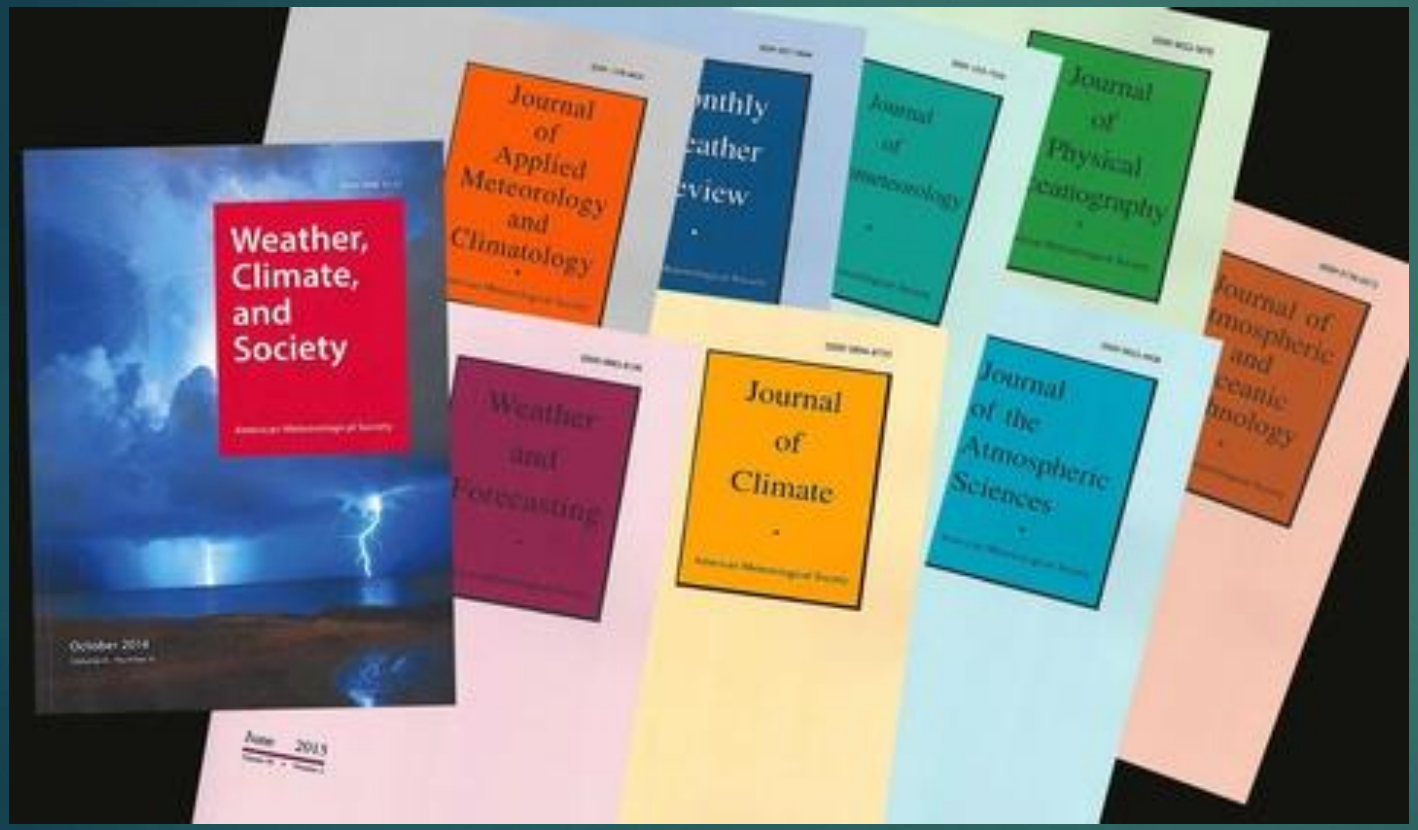
Future: Decisions Now — Future Warming



- Decisions on energy use will determine the path of warming
- Also based on agricultural practices, deforestation


Larsen A Ice Shelf (collapsed in 1995)
Larsen B Ice Shelf (collapsed in 2002)
Edward Bransfield charted this region in 1820, establishing the British claim to discovery of Antarctica. The following year members of a sealing expedition led by John Davis, an American, went ashore at Hughes Bay, the first known landing
Larsen C Ice Shelf
LARSEN ICE SHELF
During the past few decades the Larsen Ice Shelf has been disintegrating on the north and along its eastern margin to the south. In recent years, the break up appears to have accelerated.
ANTARCTIC PENINSULA
GRAHAM LAND
PALMER LAND
ALEXANDER ISLAND
ANTARCTIC CIRCLE
Joinville Island
D'Urville I.
Bransfield I.
Moody Point
Danger Islands
Dundee Island
Paulet Island
Andersson Island
Vega I.
Seymour Island
Snow Hill Island
James Ross Island
Trinity Peninsula
Cape Longing
Robertson Island
Sea Nunataks
C. Fairweather
Cape Framnes
Cape Disappointment
Jason Pen.
Churchill Pen.
Cape Alexander
Wiencke I.
Graham Coast
Loubet Coast
Foyn Coast
Oscar II Coast
Nordenskjöld Coast
Danco Coast
Cabinet Inlet
Cole Peninsula
Mill Inlet
Francis I.
Hollick-Kenyon Pen.
Hearst Island
Ewing I.
C. Collier
C. Dolleman I.
C. Boggs
Steele I.
Cape Sharbonneau
C. Bryant
Cape Knowles
Butler Island
Joerg Pen.
Wilkins Coast
Bowman Coast
Eternity Ra.
East Base
U.S.
Fallières Coast
Black Coast
Mt. Jackson
Merz Peninsula
Pullen I.
Cape Mackintosh
Kemp Peninsula
Cape Brooks
Cape Fiske
Smith Peninsula
Bowman
Fleming Glacier
Dyer Plateau
Heritzler Ice Piedmont
Gutenko Mts.
Mt. Ward
Mt. Courtauld
Bugge Is.
C. Jeremy
Batterbee Mts.
Goodenough Gl.
Seward Mts.
Mt. Coman
Lassiter Coast
Irvine Gl.
Wetmore Gl.
Latady Mts.
Copper Nunataks
Ketchum Gl.
Scaife Mts.
Mt. Vang
Sweeney Mts.
Mt. Edward
Eklund Is.
Mt. Stephenson
Douglas Range
Uranus Gl.
Saturn Gl.
LeMay Range
Roberts Ice Piedmont
Bongrain Ice Piedmont
Lazarev Bay
Rothschild Island
Schubert Inlet
Wilkins Sound
Marion Nunataks
C. Mawson
Adelaide Island
Pourquoi Pas I.
Amiot Islands
Kirkwood Islands
Liard I.
Cape Mascart
Lavoisier Island
BISCOE ISLANDS
Pitt Islands
Matha Strait
Darbel Bay
Lallemand Fjord
Laxbeuf Fjord
Marguerite Bay
Wordie Ice Shelf
Grandidier Channel
Lehrke Inlet
Smith Inlet
Stefansson Strait
Whirlwind Inlet
Revelle Inlet
Odom Inlet
Hilton Inlet
Violante Inlet
Mosby Gl.
New Bedford Inlet
Swann Glacier
Wright Inlet
Haines Gl.
Adie Inlet
Evans Gl.
Hughes Bay
Gerlache Str.
Bismarck Str.
Pascochea Bay
Prince Gustav Channel
Erebus and Terror Gulf
Duse Bay
Dolabe I.
Joinville Channel
Antarctic Sound
65°
70°
430
399
486
437
443
421
2761
2103
2987
2225
2600
3184
1171
1637

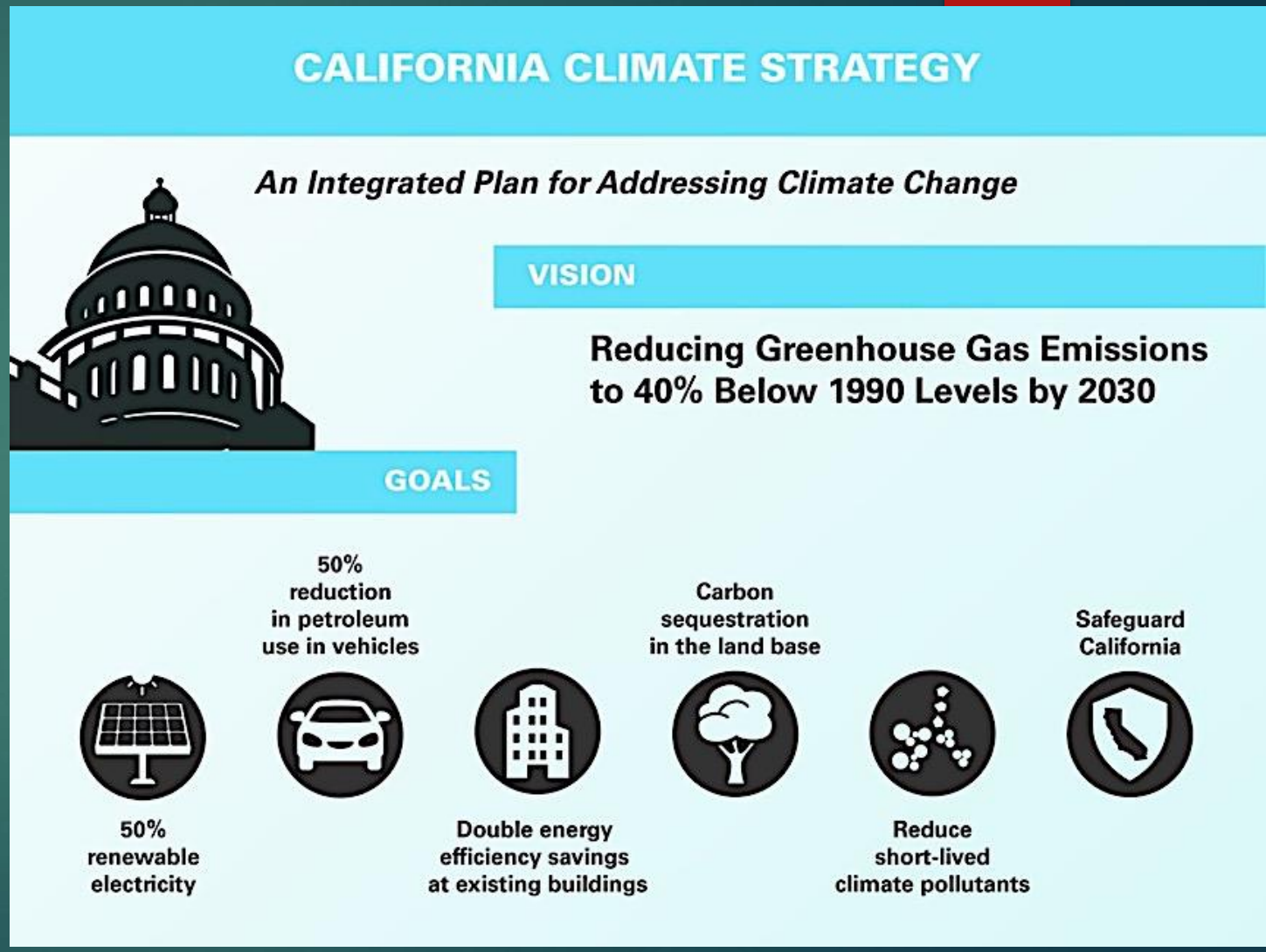
Science: Consensus



- 97% of actively publishing climate scientists agree that human-caused climate change is happening.
- 99.9% of scientific research studies published in peer-reviewed scientific journals attribute climate change to human activity
- Nothing else can explain the observations

Our Paris commitment

- NZ's pledge is to reduce our greenhouse gas emissions by 30% below 2005 levels by 2030
- …equivalent to 11% below 1990 levels by 2030
- Yet… 40% cut from 1990 levels by 2030
- …is California's bi-partisan, mandated goal

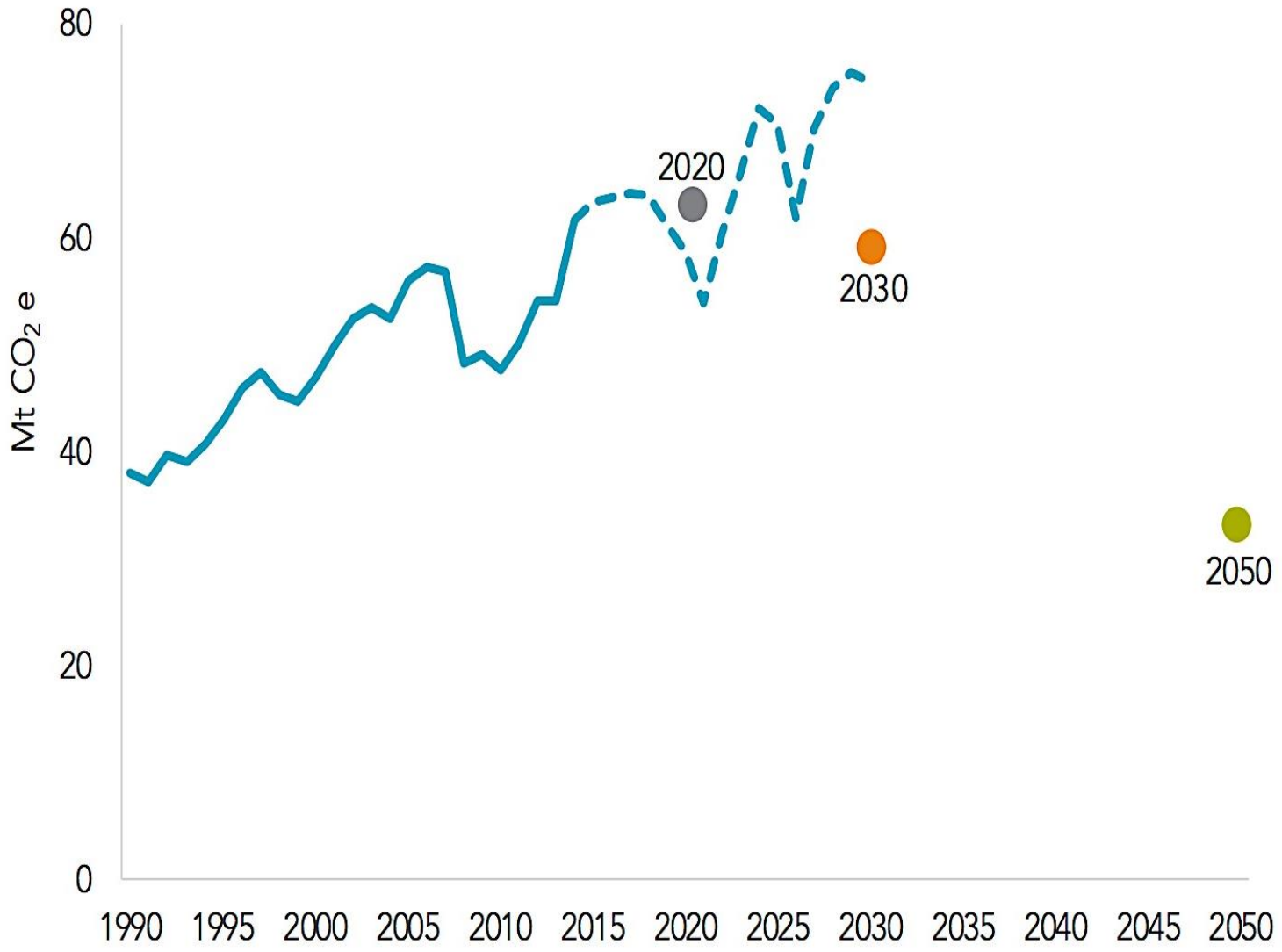


What we promise …vs. we're doing

- We're missing our Paris commitments by miles

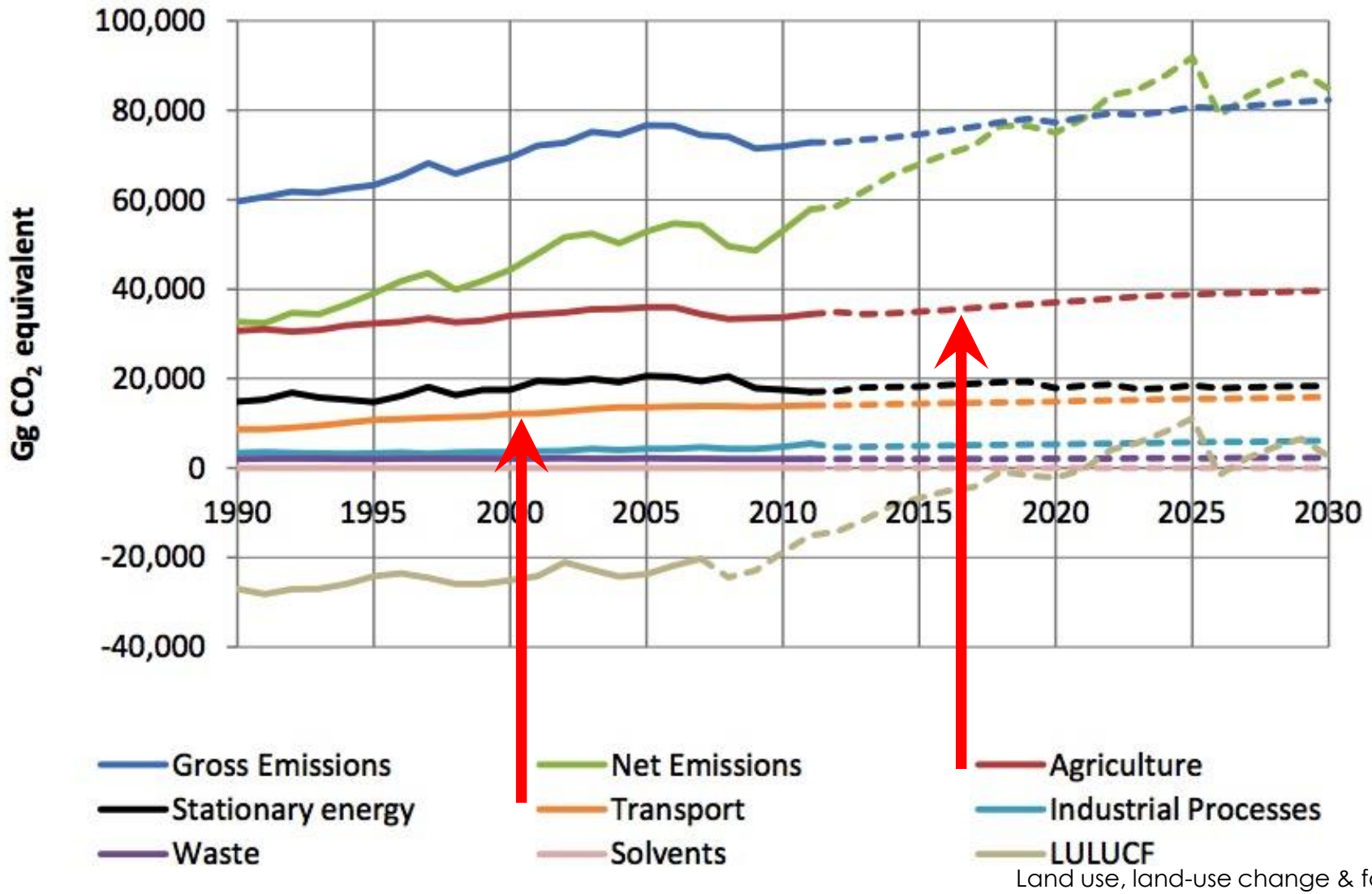
- http://www.productivity.govt.nz/inquiry-content/3254?stage=2

Figure 3 **New Zealand's net emissions from 1990 to 2013, future projections and current emission targets for 2020, 2030 and 2050**



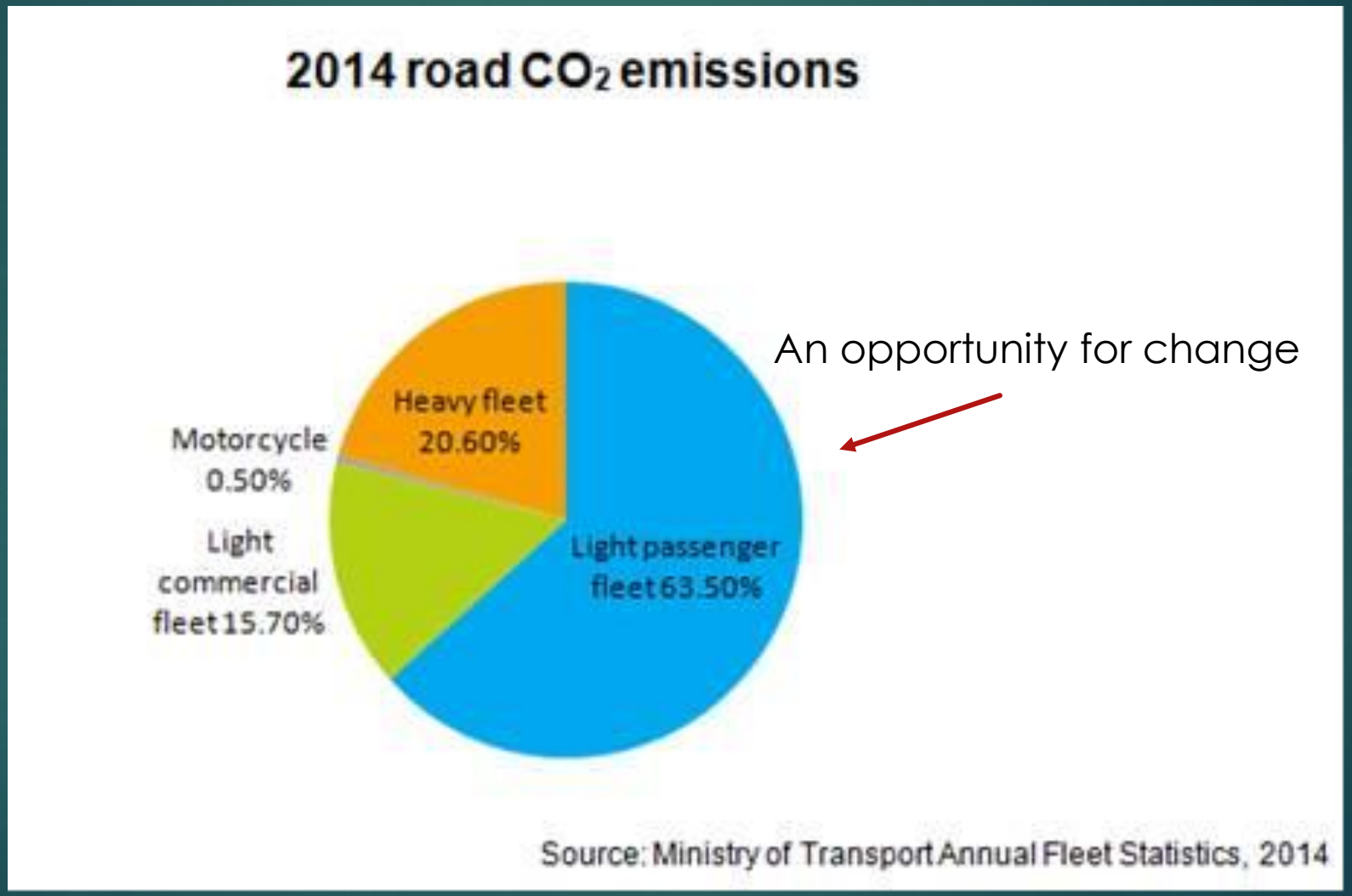
Source: MfE (2015a)

NZ's greenhouse gas emissions



Farm Animals Release Methane From their Wastes

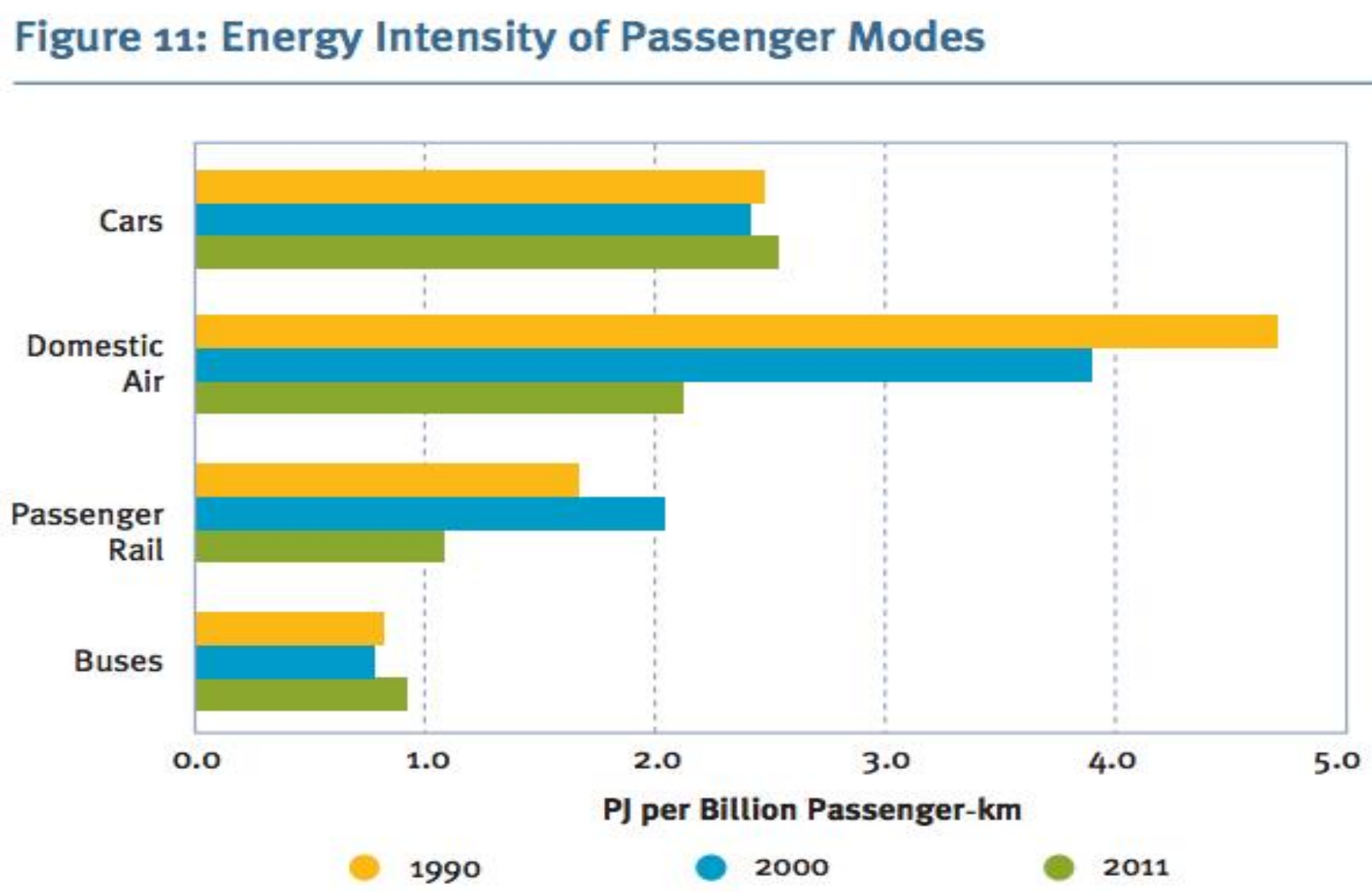
In NZ, road transport is a big issue



An opportunity for change

1% of NZ's fleet of EVs and plug-in hybrids (9 cars)
at the Auckland pre-Paris climate march, November 2015

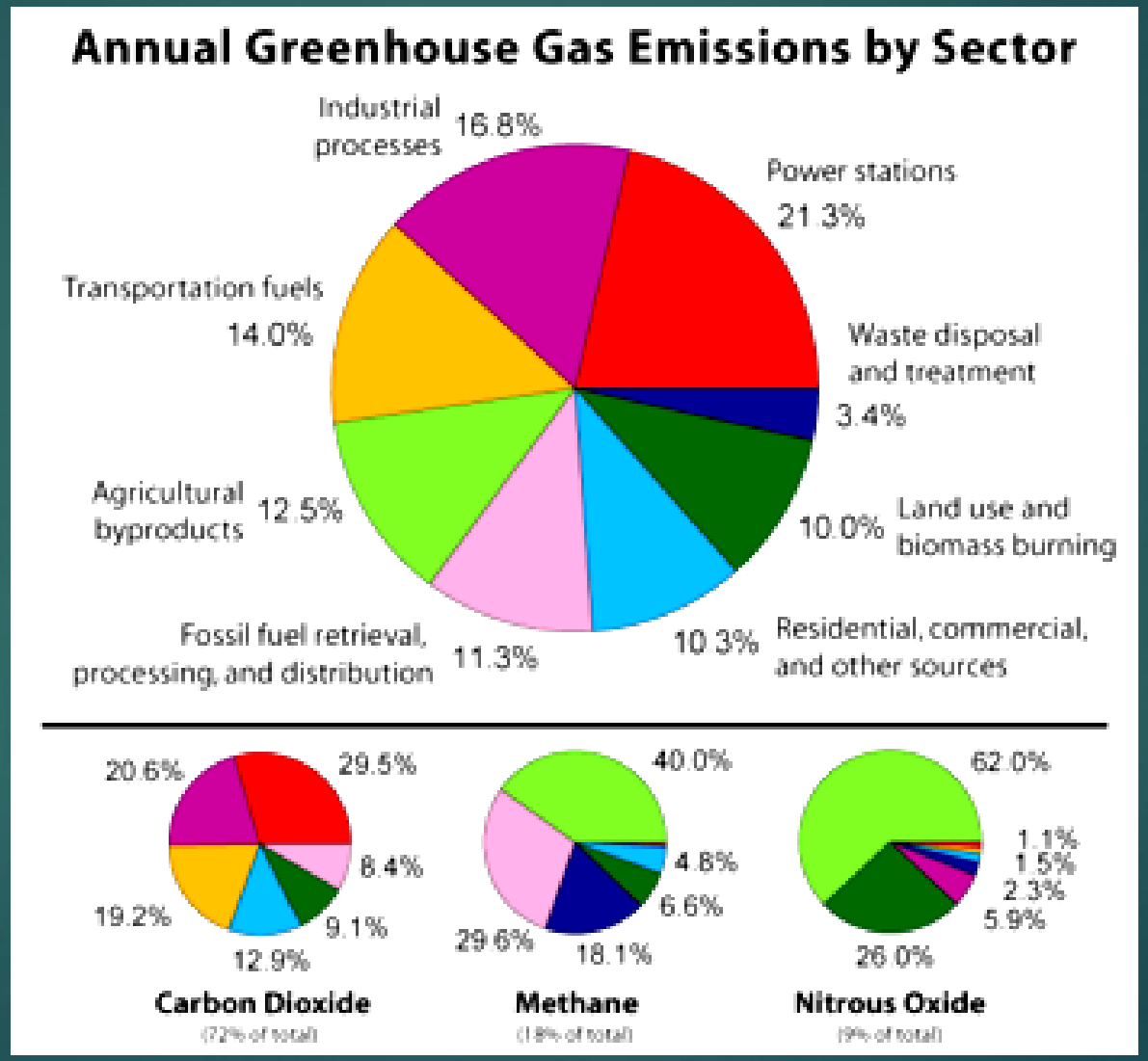
Aviation…highest emissions but greatest improvement



Deforestation reduces natural absorption of carbon dioxide (CO2)

More Greenhouse Gases Mean a Warmer Earth

Global figures



www.stuffintheair.com/global-energy-balance.html

To whom does climate change matter?

- To everyone
  - Survival of the biosphere and human race!
  - Avoid the '6th extinction'
  - Vision a future and work towards it
- To the world's poorest communities
    - More vulnerable to food and water shortages and conflict
- To faith communities
  - Existing communities: responses to isolation, depression and despair
  - A spiritual approach: life is sacred, and so is our habitat
    - Use it sustainably, don't exploit it
- To Christian churches
  - Care for Creation and Social Justice

Why do we care as Christians?

- Care for Creation
  - The Lord God took the man and put him in the garden of Eden to till it and to care for it.

    Genesis 2:15
- Social justice
  - The poorest sectors of society will suffer first and worst
  - Sea level rise
    - Pacific islands, Bangladesh, coastal China
  - Extreme climate events: flood; drought; wetter, faster hurricanes
  - Food and water scarcity, bringing conflict

The Lord God took the man and put him in the garden of Eden to till it and to care for it.

Genesis 2:15

The Five Marks of Mission of the Anglican Communion

- To proclaim the Good News of the Kingdom
- To teach, baptise and nurture new believers
- To respond to human need by loving service
- To transform unjust structures of society, to challenge violence of every kind and pursue peace and reconciliation
- To strive to safeguard the integrity of creation, and sustain and renew the life of the earth

Rt. Revd David Moxon

- *"Climate change reflects the denial of social justice. Climate change is occurring because people in rich countries are consuming resources and generating waste (particularly CO_2) at a rate that is overwhelming the processes that sustain the biosphere. We consume resources at a rate that would require 3-4 Earths if everyone on earth consumed at the same rate. Jeremiah connected ecological collapse, injustice and neglect of the moral order, with neglect of the true worship (Jer. 5: 22-28). Unrestrained consumption is inherently unjust and is not an option for disciples of Christ."*

Archbishop of Canterbury, Rowan Williams, 2005

'For the Church of the 21st Century, good ecology is not an optional extra but a matter of justice.

It is therefore central to what it means to be a Christian.'

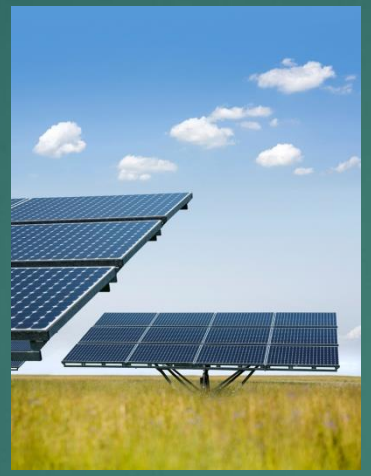
Some spiritual/moral issues

- Willingness to acknowledge that there is a problem
- Willingness to accept that this is **my** problem
  - Not just somebody else's or the government's
- Willingness to acknowledge that the problem represents a spiritual/moral issue
  - We enjoy our consumer lifestyle while others suffer (= social injustice)
  - Idolatry = 'to value something or someone in a way that hinders the love and trust we owe to God' [our consumer goods and lifestyle?]
- Willingness to change personal lifestyles
  - 'Repentance' = acknowledgment then change
- Willingness to work as faith communities on changing our lifestyles

What is being done about climate change?

- Governments
  - International agreements: in Kyoto, Copenhagen, Paris
  - Emissions trading scheme (National/Labour), proposed carbon tax (Greens)
- Regional/local bodies
  - Auckland City Council sustainability planning and divestment from fossil fuel industry
  - Divestment by Universities and other institutions
- NGOs
  - 350.org, Generation Zero, the 'zero carbon act'
- Schools
  - Education on causes and responses of climate change
- Faith communities: statements of concern, and some actions
  - Christian: Anglican, Catholic ('Laudato Si'), Methodist, Presbyterian and others
  - Others: Jewish, Buddhist, Hindu, Islamic, Shinto etc

Alternative Energy Sources and What You Can Do



What sort of change is needed?

- "…the shift from the old economy to a new, low-emissions economy will be profound and widespread,

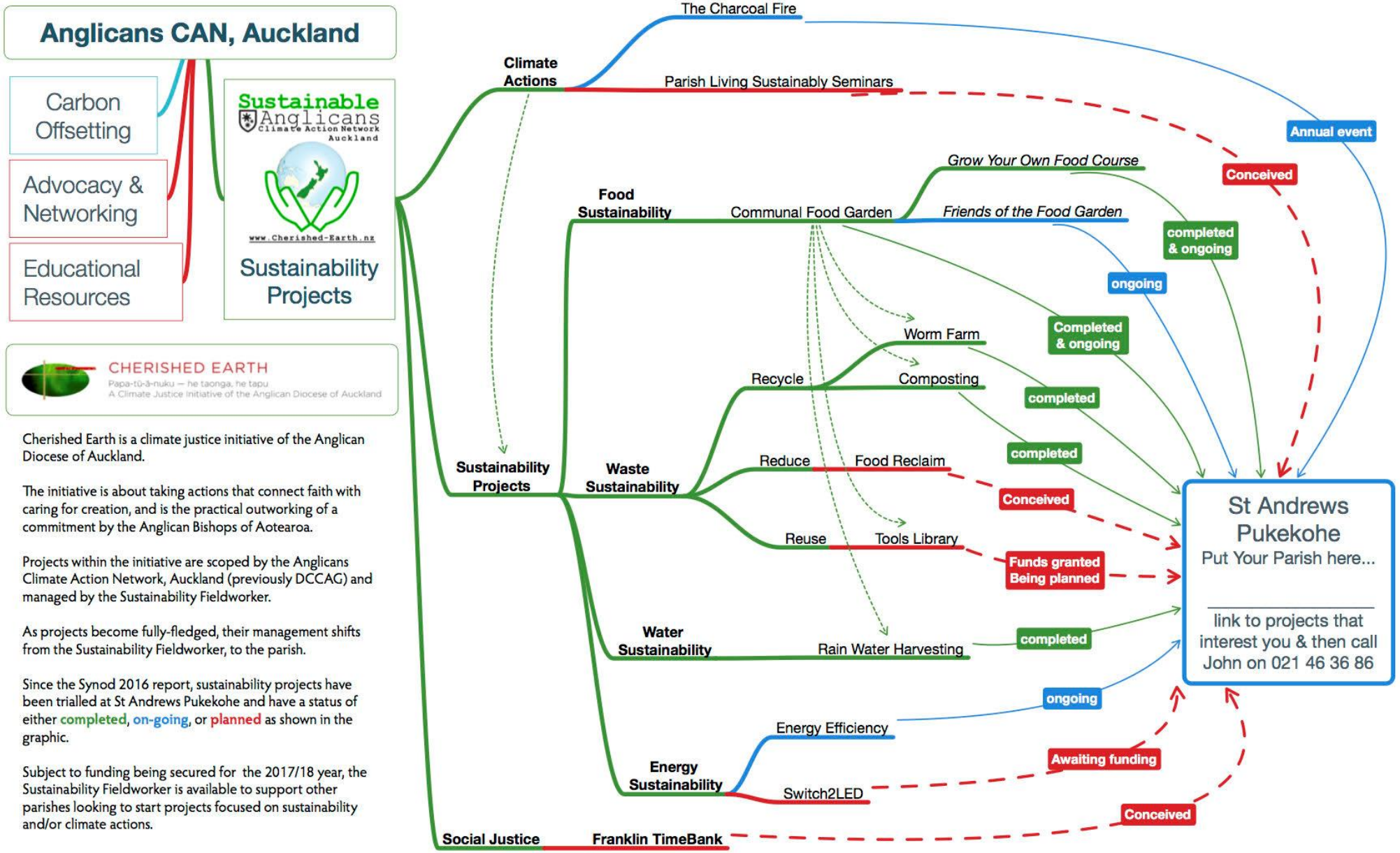
  transforming land use, the energy system, production methods and technology, regulatory frameworks and institutions,

  and business and political culture."

- New Zealand Productivity Commission
  Low carbon economy, August 2017
- http://www.productivity.govt.nz/inquiry-content/3254?stage=2

- Final report, with recommendations due June 30, 2018

What one ministry unit is doing



Thought for today

- St. Matthews in the City is already demonstrating its concern for the poorest sectors of society
- Could we also become a flagship church for sustainable living?

“You’ll have no future…

…if you don’t make one for yourself”

Johnny Rotten

Pure Advantage

- One of the few thought leaders on our big transition to a low carbon economy
- Business-backed advocates of
- ...clean technology
- ...low carbon
- ...deep sustainability
- http://pureadvantage.org/

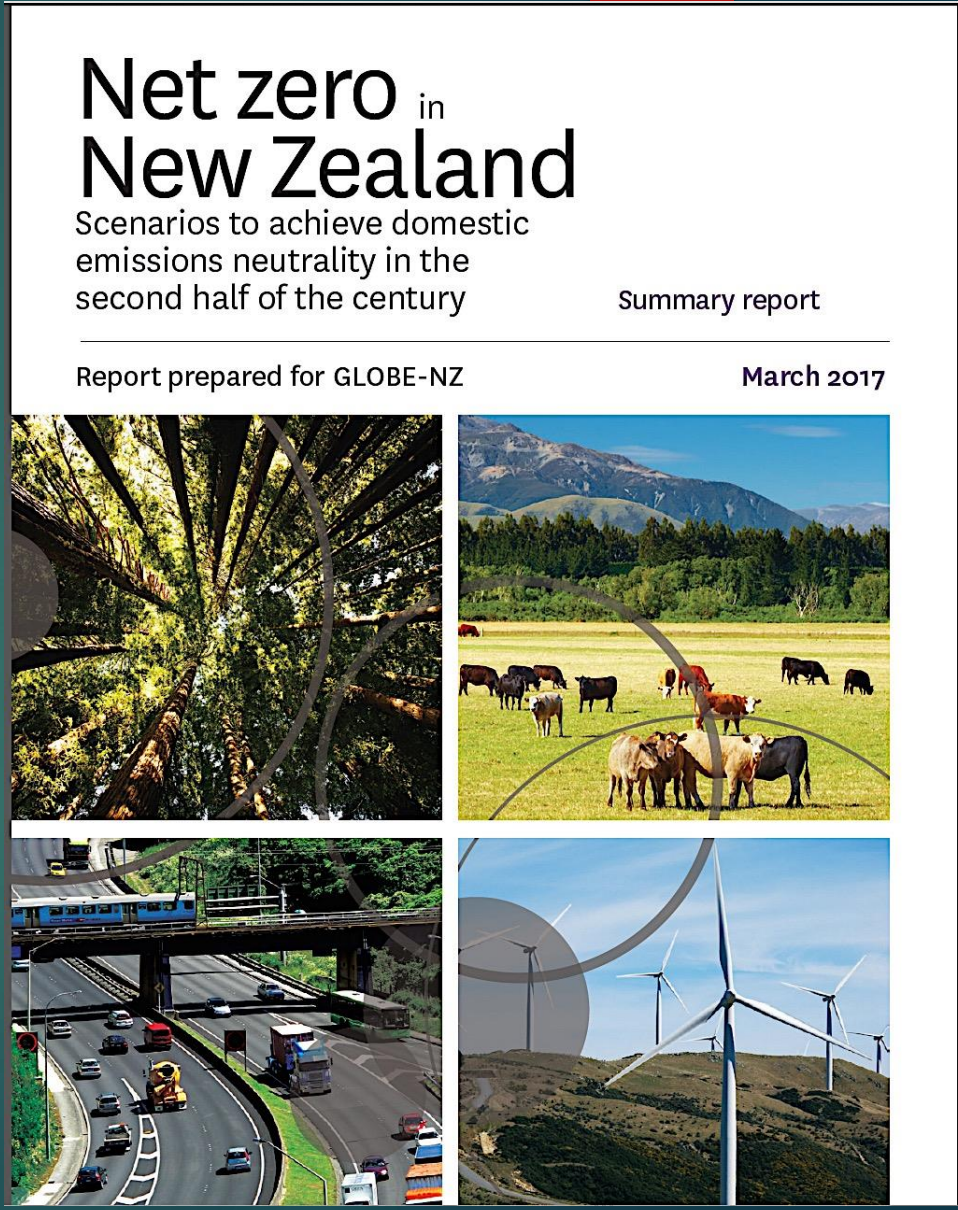
PROLOGUE

As a member of the Joint Project Committee, Pure Advantage is pleased to be involved in the release of Net Zero New Zealand. The report was authored by London-based Vivid Economics under contract to GLOBE-NZ, a national chapter of GLOBE-International, the worldwide association of parliamentarians working to protect and improve the environment. The analysis included a substantial programme of engagement with stakeholders from government, business and civil society in New Zealand.

Net Zero New Zealand is one of the first attempts to use scenario analysis to help illuminate New Zealand's long-term low-emission pathways in order to meet the country's obligations under the Paris Agreement. The report identifies four domestic emission reduction scenarios through 2050 which would position New Zealand to achieve emissions neutrality later in the century. The three elaborated scenarios are: Off Track

Net Zero New Zealand

- Very encouraging NZ roadmap to a low carbon economy
  - ...and the dangers of sticking where we are
- Commissioned by Globe-NZ (all-party group of MPs), business and others
- Report produced by Vivid Economics of the UK
- Report, and slides from Beehive launch:
  - http://www.vivideconomics.com/publications/net-zero-in-new-zealand



Net zero in New Zealand

Scenarios to achieve domestic emissions neutrality in the second half of the century

Summary report

Report prepared for GLOBE-NZ

March 2017

References

- AR5 report of the UN Intergovernmental Panel on Climate Change (IPCC)
  - https://www.ipcc.ch/report/ar5/
- Globe-NZ report to Parliament
  - http://www.vivideconomics.com/publications/net-zero-in-new-zealand
- Pure Advantage
  - http://pureadvantage.org/
- Zero carbon act
  - https://zerocarbonact.nz/
- 'Blue Greens' policies
- Political party policies
  - Greens, Labour, Blue-Greens etc
- 'Investing in People and the Planet '(Robert Howell, a NZ Quaker)