Climate Progress: A Systems Thinking View

Andrew Jones

Presentation to CCL
July 2017
Progress Seen On Warming, With a Caveat

By JUSTIN GILLIS and SOMINI SENGUPTA    SEPT. 28, 2015
What does the Paris Agreement do?

Full Implementation of Paris Agreement & other announced national policies

Source: MIT Sloan/Climate Interactive
http://climateinteractive.org
How is C-ROADS used?

• Policymakers & negotiators:
  • US, China, Brazil, others
  • UN SG’s office
  • UN “Emissions Gap” studies
  • Others

“I have to tell you — C-ROADS works, it is important, and it is already getting broad dissemination... I used it!”

John Kerry
World Climate Role-play simulation

Netherlands
Hyderabad
Kuala Lumpur
MIT
Kenya
Vanuatu
Morocco
Paris
Germany
World Climate Role-play simulation
643 events in 74 countries reaching 32,495 participants

https://www.climateinteractive.org
Global Greenhouse Gas Emissions (GtonsCO$_2$e/year)

- No Action
  - Current INDCs (No Continued Progress)
  - Ratchet Success

Expected Temp Anomaly 2100:
- **4.5°C (8.1°F)** with a 90% CI of **2.6 to 5.9°C (4.8 to 10.6°F)**
- **3.4°C (6.3°F)** with a 90% CI of **2.0 to 4.6°C (3.6 to 8.2°F)**
- **1.8°C (3.2°F)** with a 90% CI of **0.9 to 2.4°C (1.7 to 4.4°F)**

Pledged Greenhouse Gas Emission Reductions

21% of global GHG reductions come from US
A Trump administration will have the ability to weaken or do away with many of the policies.
What changes do you think are necessary and feasible to address climate change?

<table>
<thead>
<tr>
<th>Population and Economic Growth</th>
<th>Carbon Price</th>
<th>Other Greenhouse Gases</th>
<th>Carbon Dioxide Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population growth</td>
<td></td>
<td>Big decrease</td>
<td>None</td>
</tr>
<tr>
<td>GDP per capita</td>
<td></td>
<td>Small decrease</td>
<td>Modest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No change</td>
<td>Major</td>
</tr>
<tr>
<td>Carbon Price</td>
<td>None</td>
<td>Big decrease</td>
<td>None</td>
</tr>
<tr>
<td>Starting Year</td>
<td>$20</td>
<td>Small decrease</td>
<td>Modest</td>
</tr>
<tr>
<td></td>
<td>$100</td>
<td>No change</td>
<td>Major</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Efficiency</th>
<th>Other GHGs</th>
<th>Energy Supply</th>
<th>Other Greenhouse Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile e.g., transport and cars</td>
<td>Big decrease</td>
<td>Less</td>
<td>None</td>
</tr>
<tr>
<td>Stationary e.g., buildings, industry, residential</td>
<td>Small decrease</td>
<td>No change</td>
<td>Modest</td>
</tr>
<tr>
<td>Big increase</td>
<td>Big decrease</td>
<td>More</td>
<td>Major</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Supply</th>
<th>Other Greenhouse Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>Big decrease</td>
</tr>
<tr>
<td>Oil</td>
<td>Small decrease</td>
</tr>
<tr>
<td>Gas</td>
<td>No change</td>
</tr>
<tr>
<td>Solar &amp; Wind</td>
<td>More</td>
</tr>
<tr>
<td>Biofuels</td>
<td>Less</td>
</tr>
<tr>
<td>New Zero C e.g., thorium fiss.</td>
<td>Big decrease</td>
</tr>
<tr>
<td>Nuclear</td>
<td>Small decrease</td>
</tr>
<tr>
<td>CCS</td>
<td>No change</td>
</tr>
</tbody>
</table>

Caveats, conditions, and considerations

(use reverse of page)
People × $/person-year × EJ/$ × CO2/EJ
10

Cities and States are Responding
Global Carbon Dioxide Emissions, 1980-2016
Your Climate Solutions Caucus

Current Climate Solutions Caucus Members

Republican Members

- Carlos Carbajal (R-CA-26)
- Rehman Rashid (R-PA-27)
- Ryan Costello (R-PA-08)
- Patrick Moehlman (R-PA-07)
- Lee Zeldin (R-NY-01)
- Mark Amodei (R-NV-02)
- Mia Love (R-UT-04)
- Brian Fitzpatrick (R-PA-08)
- Elise Stefanik (R-NY-21)
- Brian Mast (R-FL-18)
- Dave Reichert (R-WA-08)
- Don Bacon (R-NB-02)
- Darrell Issa (R-CA-49)
- Rodney Davis (R-IL-13)
- John Faso (R-NY-19)
- Peter King (R-NY-02)
- Tom Reed (R-NY-23)
- Mika Coffman (R-CO-06)
- Mike Gallagher (R-WI-08)
- Claudia Tenney (R-NY-22)
- Scott Taylor (R-VA-02)
- Barbara Comstock (R-VA-10)
- David Joyce (R-OH-14)

Democratic Members

- Ted Deutch (D-FL-22)
- Alan Lowenthal (D-CA-47)
- Brendan Boyle (D-PA-14)
- John Delaney (D-MD-06)
- Seth Moulton (D-MA-06)
- Scott Peters (D-CA-52)
- Suzanne Bonamici (D-OR-01)
- Peter Welch (D-VT-00)
- Jim Himes (D-CT-04)
- Don Beyer (D-VA-08)
- Earl Blumenauer (D-OR-03)
- Charlie Crist (D-FL-13)
- Juan Vargas (D-CA-51)
- Jerry McNerney (D-CA-09)
- Anna Eshoo (D-CA-18)
- Daniel Lipinski (D-IL-03)
- Thomas Suozzi (D-NY-03)
- Annie Kuster (D-NH-02)
- Salud Carbajal (D-CA-24)
- Mike Thompson (D-CA-05)
- Jimmy Panetta (D-CA-20)
- Stacey Plaskett (D-VI-00)
- Rick Nolan (D-MN-08)
40 national and 24 subnational jurisdictions are putting a price on carbon

• 7 out of the 10 largest global economies put a price on carbon

Over the Tipping Point

- Cost of Renewable Energy
  - Government Subsidies
    - Cost of Renewable Energy
  - R&D, Production Experience, Field Experience, Economies of Scale, Public Acceptance
    - Demand for Renewable Energy
      - Carbon Tax, Emissions Cap
        + Price of Fossil Fuels
          + Price of Renewable Energy
            - Human Ingenuity
              + R

- Demand for Renewable Energy
  - Carbon Tax, Emissions Cap
    - Price of Fossil Fuels
      + Price of Renewable Energy
        - Human Ingenuity
          - R

- Price of Renewable Energy
  - Human Ingenuity
    + R

- Human Ingenuity
China: Production and Consumption of Coal

Billion Metric Tons Oil Equivalent

Gail Tverberg
OurFiniteWorld.com
Multisolving

https://www.climateinteractive.org/programs/multisolving/flower/
Social Change Looks Impossible Until It is Completed


Tracking the Pace of Social Change
Number of states that have removed a ban, by year
(Prohibition shows the number of states that enacted)

- Interracial marriage
- Prohibition
- Women's suffrage
- Abortion
- Same-sex marriage
- Recreational marijuana

Legend:
- Federal action taken
- No federal action

States in U.S.
“First they ignore you, then they ridicule you, then they fight you, and then you win.”
DIVEST
KEEP FOSSIL FUELS IN THE GROUND®
1 Standing Rock
IT'S NOT GOING TO BE EASY, IT'S GOING TO BE WORTH IT
Thank You!

Andrew Jones

apjones@climateinteractive.org

All simulations available at climateinteractive.org