Applied Economics Clinic

The Applied Economics Clinic is a 501(c)(3) non-profit consulting group housed at Tufts University's Global Development and Environment Institute. Founded in 2017, the Clinic provides expert testimony, analysis, modeling, policy briefs, and reports for public interest groups on the topics of energy, environment, consumer protection, and equity, while providing on-the-job training to a new generation of technical experts.

Our mission is to:

1. Provide low cost and (when we receive foundation grants) pro bono expert services to public interest groups on the topics of energy, environment, consumer protection, and equity.

2. Train the next generation of expert technical witnesses and analysts by providing applied, on-the-job learning experiences to graduate students in related fields.

3. Work proactively to support and promote diversity in the fields of economics, engineering, math and sciences.

www.aeclinic.org
(CNN) — A stark new report from the global scientific authority on climate change calls on individuals, as well as governments, to take action to avoid disastrous levels of global warming.

The report, which maps out four pathways to cap Earth's average surface temperature at 1.5 degrees Celsius (2.7 degrees Fahrenheit) above pre-industrial levels indicates that changes in individual behavior can make a difference.

But to do that, the UN's Intergovernmental Panel on Climate Change (IPCC) says, would require "rapid, far-reaching and unprecedented changes in all aspects of society."

The IPCC's models emphasize the need for people to change their lifestyle and consumption patterns to more sustainable alternatives, specifically in areas they can control, like modes of transportation, the buildings they inhabit and their dietary preferences.

"It's a really new way for the IPCC to report on mitigation pathways, the carbon budgets are so tight for 1.5C that we need drastic action on the policy scale, the business and industry scale, but also on the part of consumers," World Wildlife Fund's lead climate scientist, Chris Weber, told CNN.

Asked whether consumers can help meet this goal, Weber responded: "Unequivocally, yes."
Consumers’ Role in Emissions Reduction

After Paris

Trump doesn’t want the government to do anything to fight climate change—so it’s on you. Here’s your plan.

By DANIEL GROSS

Can consumer choices ward off the worst effects of climate change? An expert explains.

Climate change isn’t all your fault. But that doesn’t mean there’s nothing you can do about it.

By Gaby Del Valle | @gabydv | gaby.delvalle@voxttmedia.com | Oct 12, 2018, 11:20am EDT

Climate change - what you can do

- We can all make a difference to climate change.
- Start simply with things you can change in your everyday environment – with a bit of practice, it’s possible for everyone to live a more sustainable lifestyle.
- Get children involved and provide ways for them to take positive action. It is important to talk about climate change with your child and listen to their ideas.
- Take action as a family or as a community. It’s fun and it also builds strong relationships and resilience for the future.
Consumers’ Role in Emissions Reduction

The Consumer’s Guide to Effective Environmental Choices

Practical Advice from the Union of Concerned Scientists

Union of Concerned Scientists (1999)
Global Emissions: From What?

What the new report on climate change expects from you

By Eliza Mackintosh, CNN
Updated 8:31 PM ET, Mon October 8, 2018

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Consumer Actions to Stop Climate Change

Here's what consumers can do

Transportation: In order to meet the 1.5°C goal, the IPCC envisions a future where people travel less, and that generally consumer preferences shift to more sustainable choices like car sharing and hybrid and electric cars. The report also looks at using more efficient modes of travel, e.g. swapping cars, trucks and planes to buses and trains.

Buildings: While this section is less prescriptive, the IPCC suggests that people shift to more sustainable behavior when it comes to their homes, for example using smart thermostats or more efficient air conditioners.

Diets: Again, the models aren’t comprehensive, but in general, the IPCC’s narrative suggests that people consume about 30% less animal products. Eating less meat is one of a number of mitigation strategies suggested by the IPCC to overhaul agricultural and land-use practices, including the protection of forests. The livestock sector is estimated to account for 14.5% of greenhouse gas emissions globally, more than direct emissions from the transport sector.

These so-called shared socioeconomic pathways (SSPs), which focus on mitigation of and adaptation to climate change, are a fairly new innovation and draw a new dimension to climate modeling: the impact of changes in human behavior.

"It's very clear just by looking at the archetypical pathways that they've [IPCC] pulled out ... that the consumer dimensions allow emissions to be cut much faster," Weber said.

Source: CNN, October 18, 2018
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C2.5. Transitions in global and regional land use are found in all pathways limiting global warming to 1.5°C with no or limited overshoot, but their scale depends on the pursued mitigation portfolio. Model pathways that limit global warming to 1.5°C with no or limited overshoot project the conversion of 0.5–8 million km² of pasture and 0–5 million km² of non-pasture agricultural land for food and feed crops into 1–7 million km² for energy crops and a 1 million km² reduction to 10 million km² increase in forests by 2050 relative to 2010 (medium confidence).¹⁶ Land use transitions of similar magnitude can be observed in modelled 2°C pathways (medium confidence). Such large transitions pose profound challenges for sustainable management of the various demands on land for human settlements, food, livestock feed, fibre, bioenergy, carbon storage, biodiversity and other ecosystem services (high confidence). Mitigation options limiting the demand for land include sustainable intensification of land use practices, ecosystem restoration and changes towards less resource-intensive diets (high confidence). The implementation of land-based mitigation options would require overcoming socio-economic, institutional, technological, financing and environmental barriers that differ across regions (high confidence). {2.4.4, Figure 2.24, 4.3.2, 4.5.2, Cross-Chapter Box 7 in Chapter 3}
Global and regional land-use and ecosystems transitions and associated changes in behaviour that would be required to limit warming to 1.5°C can enhance future adaptation and land-based agricultural and forestry mitigation potential. Such transitions could, however, carry consequences for livelihoods that depend on agriculture and natural resources \{4.3.2, Cross-Chapter Box CB6 in chapter 3\}. Alterations of agriculture and forest systems to achieve mitigation goals could affect current ecosystems and their services and potentially threaten food, water and livelihood security. While this could limit the social and environmental feasibility of land-based mitigation options, careful design and implementation could enhance their acceptability and support sustainable development objectives (medium evidence, medium agreement). \{4.3.2, 4.5.3\}

Source: IPCC SR1.5 Technical Summary
There is increasing agreement that overall emissions from food systems could be reduced by targeting the demand for meat and other livestock products, particularly where consumption is higher than suggested by human health guidelines. Adjusting diets to meet nutritional targets could bring large co-benefits, through GHG mitigation and improvements in the overall efficiency of food systems (Erb et al., 2009; Tukker et al., 2011; Tilman and Clark, 2014; van Dooren et al., 2014; Ranganathan et al., 2016). Dietary shifts could contribute one-fifth of the mitigation needed to hold warming below 2°C, with one-quarter of low-cost options (Griscom et al., 2017). There, however, remains limited evidence of effective policy interventions to achieve such large-scale shifts in dietary choices, and prevailing trends are for increasing rather than decreasing demand for livestock products at the global scale (Alexandratos and Bruinsma, 2012; OECD/FAO, 2017). How the role of dietary shift could change in 1.5°C-consistent pathways is also not clear (see Chapter 2).

Source: IPCC SR1.5 Ch.4
Consumer Actions to Stop Climate Change

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Global Emissions: From What?

Global Greenhouse Gas Emissions by Economic Sector

- Industry: 21%
- Transportation: 14%
- Buildings: 6%
- Agriculture, Forestry, and Other Land Use: 24%
- Electricity and Heat Production: 25%
- Other Energy: 10%

Decision-Making Locales

• **Kitchen Table**
  - *What decisions can be made by individual consumers (under constraints of market availability)?* Vehicle or transportation mode; electric distributor; space heating mode and efficiency

• **Boardroom**
  - *What decisions are made by (often very large) businesses?* Fuels; vehicles; electric generation fuel; electric source and fuel types sold to consumers; vehicles and heating/cooling sold to consumers
CO\textsubscript{2} Energy Emissions by Sector, 2015

- Business Transport: 28%
- Business Electricity: 22%
- Industrial Direct Fuel: 19%
- Commercial Direct Fuel: 5%
- Residential Direct Fuel: 6%
- Residential Electricity: 13%
- Residential Transport: 7%

U.S. EIA State CO\textsubscript{2} emissions data
U.S. EIA 861 data,
CO₂ Energy Emissions by Sector, 2015

- Residential
- Commercial and Industrial

Share of state CO₂ emissions by state.
CO₂ Energy Emissions by Sector, 2015

U.S. EIA State CO₂ emissions data
U.S. EIA 861 data,
Who can impact which energy choices?

U.S. EIA State CO$_2$ emissions data
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• **Regulatory Space**
  • *What decisions are made by state utility commissions, state legislators (as they impact on commissions), and other regulatory bodies?* Fuel availability; electric generation fuels and emissions; energy efficiency and other demand-side mandates
Who can impact which energy choices?

- Residential Electricity: 13%
- Residential Transport: 7%
- Residential Direct Fuel: 6%
- Business Electricity: 22%
- Business Transport: 28%
- Industrial Direct Fuel: 19%

Kitchen Table: Boardroom

Regulatory Space
Impacting on the Regulatory Space

• Stakeholders can intervene in regulatory processes
• Environmental and consumer groups are active in this space
• Both regulations and the ways in which they are applied can and do shift overtime, sometimes in response to intervenors participation in regulatory proceedings
Thank you!

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