

# The Annotated “Take AIM at Climate Change”

## Verse 4

**Singer:** “So I’ll turn down the heat and watch what I eat<sup>1</sup>,  
But what can I do to take a long-term view<sup>2</sup>?”

**MC:** We need smarter ideas for sustainable policies<sup>3</sup>  
New technologies for a new green economy<sup>4</sup>.

New discoveries, and new questions to ask

‘Cuz we can figure out the future by examining the past<sup>5</sup>.

So we sail to the Poles, and sample the extremes<sup>6</sup>,

And drill into the ice, and discover what it means<sup>7</sup>.

So use that brain, and make science a priority<sup>8</sup>

And you can work on stopping global warming with authority.

So act now, there’s no time for games<sup>1</sup>.

It’s time to take aim.

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<sup>1</sup>In case you didn’t catch this in the Verse 3 notes, here’s a few facts about how food and energy use are connected. A *New Scientist* article claims that producing “A kilogram of beef is responsible for more greenhouse gas emissions and other pollution than driving for 3 hours while leaving all the lights on back home.” (<http://www.newscientist.com/article/mg19526134.500>) Eating high on the food chain is less energy efficient than eating low on the food chain. Consider that eating a meat-rich diet requires production of animal feed that needs fertilizer and is typically transported by low-efficiency vehicles to animal feed lots. Then the animals are once again put into low-efficiency vehicles for transport to processing centers where electricity is required for refrigeration of the products. If everyone on the planet ate as much meat as Americans some calculations suggest that we’d need two planet Earths to produce enough meat to feed all of us. Not only is meat consumption an issue, but consider where all of your food comes from. Processed food requires shipping many ingredients to one location to create the food (which also uses electricity) and then trucking it to your grocery store. Many people are now choosing to eat locally-grown food (<http://100milediet.org/why-eat-local>) in order to reduce CO<sub>2</sub> emissions and to get better tasting, fresher food.

<sup>2</sup>We’ve all heard that eating well and exercising is the best recipe for a long and healthy life. As residents of Earth, it is also important to think of the long-term health of our planet (it’s not like we can move!) While we all have immediate needs, such as food, clothing and shelter, it’s also prudent to also consider the legacy of our actions and the quality of the Earth for future generations. One community is already doing just that. The town of Greensburg, Kansas, was leveled by a powerful tornado on May 4, 2007. This event provided residents to “think long term” in their rebuilding efforts. They decided to build the first new “green” city where nearly all of the new structures are highly energy-efficient

and many have earned LEED certification (<http://www.usgbc.org/DisplayPage.aspx?CategoryID=19>). One long-term goal of the residents was to save money on electric bills. This had the added benefit of reducing their carbon dioxide emissions from electricity usage.

<http://www.npr.org/templates/story/story.php?storyId=92076242>

<sup>3</sup>Sustainability means “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” This is the ‘Brundtland definition’ coined in 1987 (<http://www.epa.gov/sustainability/basicinfo.htm#sustainability>). The Earth has finite resources and developing a sustainable society is no small challenge. It certainly requires some creative thinking! Consider for a minute the impact of just one simple product you probably own – a pencil. Making a pencil requires raw materials (wood, wax, graphite, clay, glue, metal, lacquer and usually an eraser) (<http://www.pencils.com/pencil-information/pencil-making>) along with electricity to create it. Are these all renewable resources? What is the impact of making or disposing of each product that goes into making a pencil? Sustainability requires us to think about how products are made, how to reduce toxic materials used to make them, and how we can recycle or reuse the parts we no longer need. Authors William McDonough & Michael Braungart have started some of this creative thinking for you in the book “Cradle to Cradle.” ([http://www.mcdonough.com/cradle\\_to\\_cradle.htm](http://www.mcdonough.com/cradle_to_cradle.htm)) Many other books have been written and it is clear that we can all play a role in assessing the sustainability of our lifestyle and then making smart choices.

<sup>4</sup>The phrase "New Green Economy" refers to the idea that far from pitting a cleaner environment with less emissions against jobs, new technologies will in fact boost employment in new industries, such as wind, solar and energy efficiency, that will also reduce carbon dioxide emissions. A recent report from the business consultancy, McKinsey and Company, provides both headlines and specifics: "Pathways to a Low Carbon Economy", one of the largest and most detailed reports of its kind, lists more than 200 opportunities, spread across ten sectors and twenty-one geographical regions, that have the potential to cut global greenhouse gas emissions by 35 percent below 1990 levels by 2030, a reduction of 70 percent from the business as usual scenario. The study was supported by ten sponsors, including World Wildlife Fund (WWF) and energy, automotive and technology companies. Here's the WWF press release and a link to the full report: <http://www.worldwildlife.org/who/media/press/2009/WWFPresitem11336.html>

We've mentioned energy efficiency several times in these notes, and jobs retrofitting old buildings - weather-stripping windows, bringing insulation up to modern standards - are being called "green collar jobs" which can replace employment opportunities lost by other industries. One of the most interesting groups pushing this idea has been GREEN FOR ALL, whose former head, Van Jones, now works in the White House with a mandate to ensure widespread and diverse participation in the new green economy. For more, please visit:

[http://www.greenforall.org/?gfa\\_splash=1](http://www.greenforall.org/?gfa_splash=1)

<sup>5</sup>“Those who cannot remember the past are condemned to repeat it” (George Santayana). Geologists and paleoclimatologists (paleo = ancient) study records of Earth’s past to learn what factors are most important in causing climate change and how the Earth responded when the Earth warmed and cooled in the past. For instance, we can look at fossils on land and on the seafloor to determine how the types of species changed in one location when the Earth moved from the last ice age to pre-industrial times. We identify how fast temperatures changed in the past and which species adapted, which migrated and which went extinct. This gives us idea of how ecosystems may respond to Earth’s warming temperatures.

<sup>6</sup>The Poles have some of the highest rates of temperature increase of anywhere on the planet. Faraday Station on the Antarctica Peninsula has warmed almost 3°C in the past 50 years. Similarly in northern Alaska, the mean annual surface temperature has warmed 2-3°C in the past few decades. The temperature increase at the poles is double to triple the warming seen elsewhere around the globe. Scientists and native communities can see that the sensitive ecosystems in the polar regions are already responding to this warming, sometimes in a dramatic way

(<http://cires.colorado.edu/science/features/thawingalaska/> and “It’s a Changing Thing”, <http://passporttoknowledge.com/polar-palooza/pp06native01.php>). Also remember that the environmental changes associated with *regional* warming actually have a *global* impact. For example, decreased sea ice reduces albedo further warming the planet, and melting permafrost releases more greenhouse gases. In order to make good model projections for future climate around the world, we need to study and try to understand all of the processes affecting Earth’s climate.

<sup>7</sup> Ice core records have provided us with essential information about the context in which we can understand current conditions on Earth. The oldest ice that scientists have collected and analyzed to date is about 800,000 years old! This ice from Dome C in Antarctica contains bubbles with air trapped back when the ice formed. This fossil air extracted from ice cores show us earth’s natural temperature and greenhouse gas cycles. There have been 8 ice ages in the past 800,000 years (<http://www.ncdc.noaa.gov/paleo/pubs/luethi2008/fig2.jpg>) and during each one CO<sub>2</sub> is typically at levels of 180 ppm (parts per million.) During warm periods, called “interglacials”, such as Earth has been experiencing for the past 10,000 years, CO<sub>2</sub> is typically 250-280 ppm. Scientists have been measuring CO<sub>2</sub> directly at Mauna Loa, Hawaii since 1958 and as of summer 2008, CO<sub>2</sub> concentrations in the atmosphere reaches values of 388 ppm (<http://www.esrl.noaa.gov/gmd/ccgg/trends/>) The ice core data tell us that these values are unusual because earth has not had CO<sub>2</sub> levels this high in 800,000 years. (For more on “Reading Ice Cores” see the POLAR-PALOOZA podcast at: <http://passporttoknowledge.com/polar-palooza/pp06geos06.php>)

<sup>8</sup> “Science is an on-going process of making observations and using evidence to test hypotheses. As new theories are developed and new data are obtained, oftentimes enabled by new technologies, our understanding evolves. The scientific community uses a highly formalized version of peer review to validate research results and our current understanding of their significance. Researchers describe their experiments, results, and interpretations in scientific manuscripts and submit them to a scientific journal in their field of science. Scientists who are experts in that field serve as “referees” for the journal: they read the manuscript carefully to judge the reliability of the research design and check that the interpretations are supported by the data. Based on the reviews, journal editors may accept or reject manuscripts or ask the authors to make revisions if the study has insufficient data or unsound interpretations. Through this process, only those concepts that have been described through well-documented research and subjected to the scrutiny of other experts in the field are published as papers in journals and considered as current science knowledge. Although peer review does not guarantee that any particular published result is valid, it does provide a high assurance that the work has been carefully vetted for accuracy by informed experts prior to publication. *The overwhelming majority of peer-reviewed papers about global climate change acknowledge that human activities are a substantially contributing factor.*” (Emphasis added. From the Federal inter-agency publication “Climate Literacy”, <http://climatescience.gov>)

<sup>9</sup> In mid-March 2009 climate scientists reported their latest findings at the International Scientific Congress on Climate Change. They have found that “the worst-case IPCC scenario trajectories (or even worse) are being realized”.

([http://climatecongress.ku.dk/newsroom/congress\\_key\\_messages/](http://climatecongress.ku.dk/newsroom/congress_key_messages/)). New data show that the global average temperatures continue to warm, sea level rise predictions for the next century have doubled from about 0.5 to 1 meter, and extreme weather events are becoming more common. In the midst of this concern, these scientists also offer hope. We already have much of the technology and many of the tools needed to reduce our greenhouse gas emissions, we just need to actually implement the changes. Consider what changes you can make today, how you can help educate others, and how you can encourage lawmakers to make the changes you want to see.