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The Latest IPCC Climate Report Sounds a Warning

George Harvey

On March 20, 2023 the United Nations Intergovernmental Panel on Climate Change (IPCC) issued its *Sixth Synthesis Report on Climate Change*, referred to as AR6. This report synthesizes three earlier reports, which had been produced in 2021 and 2022. One thing that we want to emphasize about the three earlier reports is that none of them is trivial in scope or size. Each, by itself, is a monumental work of science.

The Physical Science Basis, the first of the three reports, was produced by 234 scientists from 64 countries, who used 14,000 scientific papers as source material. The report itself is 2,409 pages long. To be published, 195 countries had to sign on, and getting them to do so also was not a trivial job as they needed to agree on a line-by-line basis. It was published on April 9, 2021.



The elephant in the living room is a metaphor. The cow on the porch is not. (Jo-Anne McArthur, Unsplash, <https://bit.ly/GET-cow-porch>)

In its thirteen chapters, *The Physical Science Basis* says that we could still stop climate warming at 1.5°C, provided that we undertook urgent action. In layman's terms, it says this is an emergency, and we should respond to it as we respond to emergencies.

On the other hand, a lack of emergency measures causes us to warm by 2.5°C to 4.0°C, with sea level rises that could range from 0.5 meters to as much as 5 meters. The former would be a severe nuisance in many coastal communities. The latter could mean some cities would be abandoned.

An editorial in *The Guardian*, "The Physical Science Basis" was called the "starkest warning yet" of "major inevitable and irreversible climate changes." UN Secretary-General Antonio Guterres said it was "code red for humanity." That was two years ago.

The Physical Science Basis can be found at www.ipcc.ch/report/ar6/wg1.

Impacts, Adaptation and Vulnerability, the second report, is 3,068 pages long. It was accompanied by a 37-page summary for policy makers. It was published on February 28, 2022. It examines impacts of climate change in terms of loss of biodiversity, migration, risks

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CONSEQUENCES OF OUR MILD WINTER

Jessie Haas

What a winter! We had abnormal cold in November, then warmer than normal months with one short, vicious cold snap. Just when it looked like spring would start in February, colder than normal weather reappeared, and the bare ground was covered with snow, and then in some places with an ungodly amount more snow. What many of us want to know is, what will be the after-effects?

The truth is, we do not know. Scientific study requires replication, and it takes years or decades to replicate seasonal changes. We can talk about what we fear and what we see, and speculate as to what might happen next, but that is all.

New York Times columnist Margaret Renkle wrote recently about the warm winter in Tennessee, where some migratory birds were appearing early and many plants were blooming two weeks ahead of schedule. The fear is that pollinators and others that feed on those blossoms may miss the window when that nectar is available, and fail to thrive and reproduce. One hopeful sign drawn from Renkle's article is that while the birds are pffaffing about looking confused, they are not nesting early. This matters because egg hatching needs to coincide with maximum caterpillar production in the immediate neighborhood. The earliest blooming plants are not



What will the consequences of our warm winter be for the upcoming seasons in 2023? (Flickr/Tom Gill)

always the natives; native plants are what feed caterpillars and moths. Renkle notes that the severe cold snap this winter killed nonnative trees and shrubs while largely sparing natives; this could turn out to be a net benefit, especially if aware homeowners replant with native species.

Sugaring season? Many places got an extremely early start, in the first part of January, a re-start in February, and are now enjoying an extended March stretch of good sap flow at the appropriate time.

Ticks? It takes a lot of cold, combined

with dry weather, to kill them. Scientist speculate that the larvae, which are hardest to see (the size of a sesame seed), will be active early due to the winter warmth. Ticks are active at 29 degrees and above. However, in many places, while March temperatures were certainly favorable, the ticks were buried in leaf litter under deep snow, which at least keeps them away from many of their hosts.

The brief cold snap could have killed some of the invasive woolly adelgid threatening northeast

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TRANSFORMATIONAL OPPORTUNITY: Making Energy Users Energy Owners

Roy Morrison

The renewable energy transformation is an essential opportunity to build a global standard in ecological and social justice by making billions of energy users become energy owners with an equity interest in the power that drives our civilization. Trillions of dollars are being invested in the renewable energy transformation. But the ownership of the renewable energy infrastructure need not remain in the hands of billionaires. Using available financial tools, energy users can become energy owners along with host community landowners and residents in year six after solar systems are installed by taking advantage of tax equity and depreciation rules applied for common community benefit.

This is more than just a case of fairness and justice. This helps establish the basis for common people having a seat at the decision-making table in controlling the



This Chelsea ground-mount solar array is making energy users energy owners. (Unsplash)

future shape of local and global renewables to optimize our collective interest. \$27 billion in Inflation Reduction Act (IRA) funds are directed to benefit of low-income census tracts. The use of the IRA grants can leverage IRA benefits by helping support organizing municipal, co-op, and association actions to take advantage of available financial tools. All energy users can

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IPCC Sounds Warning

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to human activities and health, food security, water scarcity, and energy. It addressed 127 negative effects of climate change, and it said that many of them could not be reversed.

Among the negative effects are that approximately 1 billion people face flooding due to sea level rise, and 3.3 billion are considered highly vulnerable in some way.

Impacts, Adaptation and Vulnerability can be found at www.ipcc.ch/report/ar6/wg2.

The third report in the series is *Mitigation of Climate Change*. Including its end materials, it is 2258 pages long. It deals with a wide selection of topics relating to mitigation. It examines energy and such other resources as agriculture and water. It looks at both the sources of carbon emissions and the ways we can emit less from them. It considers what is needed for cities and industry to reduce emissions and live with the results of climate change, and it also considers the finances that will make the changes possible. It was published on April 4, 2022.

Mitigation of Climate Change can be found at www.ipcc.ch/report/ar6/wg3.

Together, these three reports represent 7,735 pages of dense, scientific reading. There are doubtless some people in this world who would read them all. The IPCC published AR6 for the rest of us, so we can get a grasp on what the reports mean.

So far, the IPCC has not put the body of AR6 on the internet. No doubt it will soon. When it does, it can be expected to be



available at www.ipcc.ch/report/ar6/syr/. In the meantime, the *Summary for Policymakers* is available at that same address.

The document has three sections, which are grouped into a total of 18 sub-sections. We will not publish all of them here. But we should produce quotations from some that we think are particularly important, all considered by the scientists to be matters of high or very high confidence. We ask readers to remember that these findings have been signed by 195 countries:

A.1 Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850–1900 in 2011–2020. Global greenhouse gas emissions have continued to increase.

A.2 Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Human-caused climate change is already affecting

many weather and climate extremes in every region across the globe.

A.4 Policies and laws addressing mitigation have consistently expanded since AR5. Global GHG emissions in 2030 implied by nationally determined contributions (NDCs) announced that by October 2021 it is likely that warming will exceed 1.5°C during the 21st century and make it harder to limit warming below 2°C.

B.3 Some future changes are unavoidable and/or irreversible but can be limited by deep, rapid and sustained global greenhouse gas emissions reduction.

B.5 Limiting human-caused global warming requires net zero CO2 emissions.

C.1 Climate change is a threat to human well-being and planetary health. There is a rapidly closing window of opportunity to secure a livable and sustainable future for all.

C.2 Deep, rapid and sustained mitigation and accelerated implementation of adaptation actions in this decade would reduce projected losses and damages for humans and ecosystems, and deliver many co-benefits, especially for air quality and health.

C.3 Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a livable and sustainable future for all. ♻️

Vermont Votes Yes to Protect Health and the Environment

Vermont Advances Bill to Protect Vermonters from PFAS and other Toxic Chemicals

The Vermont Senate has voted to advance S.25, which would restrict the use of toxic chemicals like PFAS in personal care products, menstrual products, textiles, and artificial turf. This bill takes important steps to protect Vermonters' health and our environment from these harmful chemicals, targeting specific areas of consumer products that are major sources of exposure and environmental contamination, including:

- Banning a list of 14 chemicals and chemical classes from personal care products and period products.
- Banning PFAS from all textiles, including apparel .
- Banning PFAS from artificial turf fields.

"Personal care products and period products are applied directly to Vermonters' skin and intimate areas every day," said Marcie Gallagher, Environmental Advocate at the Vermont Public Interest Research Group (VPIRG). "Textiles represent the largest source of PFAS in our landfills, and children are exposed to turf over long periods of time. Every exposure pathway matters, and S.25 takes an important step to stop these harmful products from entering our marketplace."

From production of the chemicals, to their transport, their use in products, and disposal in our landfills, toxic chemicals pose threats to communities throughout their lifecycle.

For each of these product categories, there are safer and cost-competitive alternatives available – or the chemicals are not necessary in the first place. This bill aligns us more closely with states like CA and WA, and many retailers are also starting to move away from the use of these toxic substances in the products they sell. It will require more companies to restrict these harmful chemicals in these product classes.

Kristi Lafayette with Vermont Skincare Company., the only Vermont-based brand producing Environmental Working Group (EWG) verified organic skincare, celebrated the Senate's passage of S.25, "This policy will help businesses like ours that have already taken it upon themselves to avoid unsafe or questionable ingredients in our products." Larry Plesent, founder of Vermont Soap Company based in Middlebury, VT applauds this, as well. Their mission is to create a "chain of good" from farm field, to factory, to you.

Read more about this important win for public health and environmental protection at <https://VCV-S.25-passes>. ♻️

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Energy Users-Energy Owners – Cont'd from p.1

become energy owners. The opportunity also applies to communities that are the hosts for renewable energy development. The model includes maintaining farm land by installing dual-use solar above pasture and row crops.

Financial Tools

Municipals, co-ops, or associations as entities enter into contracts with renewable developers for long term agreements to buy renewable power. The energy users put up zero money. This long-term contract reduces interest rates for developers. The agreement enables the future affordable purchase of the solar systems by energy users.

Commercial solar development is driven by extensive tax credits in the first five years. In year six, the 30% to 70% Investment Tax Credit (ITC) benefits under the IRA are "exhausted" along with the Modified Accelerated Cost Recovery System (MACRS) depreciation. Beneficiaries of the tax credits must own and operate the system to keep the tax credit and accelerated depreciation benefits until year six after solar construction.

Under U.S. IRS rules, solar developers can receive an investment tax credit (ITC) of at least 30% of their capital costs (which now includes interconnection and storage costs) and can reach 50% under the new IRA if more than half of the benefits are shared with resident in low-income census tracts, and 70% meeting domestic content and prevailing wage rules. In addition, the new energy user owners receive accelerated MACRS depreciation based on the value of the purchase.

Steps to Energy User Renewable Ownership at Almost any Scale

1. A municipality or cooperative or association contracts with a renewable developer of their choice. For example, let us say Solar Developer (SD) is to buy solar power for at least 20 years at defined prices. The negotiated price will cover SD's capital cost to build, pay loan interest, operation and maintenance, insurance. SD will work with interested banks or credit unions or

community development financial institutions (CDFIs), during the contracting process. The agreement with municipality, cooperative, or the association is key to finance at a reasonable rate for the SD. In addition to solar, the agreement could include wind, geothermal, bio-energy and free-standing storage.

2. SD will finalize negotiations with financial institution for construction funding to be transformed into a long-term mortgage following the commercial operation date (COD).
3. At the COD, renewable power flows to the town, and income flows to the SD to pay its mortgage and maintain the solar and storage system.
4. The contract with the municipality, cooperative, or the association gives them the right to buy a full or partial interest in the solar system plus storage beginning in year six when tax equity is exhausted.
5. Opting to buy the system in year six takes advantage of the stream of income from existing the energy purchase contracts for the system and profit for the SD. The value of the system in year six is substantially reduced after tax equity and MACRS are exhausted. A negotiated fair price can be part of reaching an agreement with the SD and not another buyer.
6. The municipality, cooperative, or the association will have its finance plan to be implemented for year six purchase. Although there is no ITC for the energy user purchase, there is new MACRS depreciation based on the value of the purchase price. Built into the purchase analysis will be a provision for an unexpected potential high number of people unable to pay their electric bills, which is



This ground-mount solar array, built in May 2021, is making energy users energy owners. (Courtesy photo)

generally small. Unless they are destitute in the midst of economic calamity, people strive to keep the lights on.

7. Each co-op or association member will have their own capital account and ownership share based on annual distributions based on their share of energy purchases and their share of profits based on energy sales and income from storage sales and participation in Virtual Power Plant (VPP) income. Members can use their equity interest for financing. Coop and associations operate on the basis of one member, one vote.

The goal is broader energy user ownership for many millions and establishing available and transparent models for renewable energy transformation.

Roy Morrison builds solar farms. His latest book is *The New Green Republic*. Visit www.SunPartnersSolar.com or send an email to roy@sunpartnerssolar.com. ♻️

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