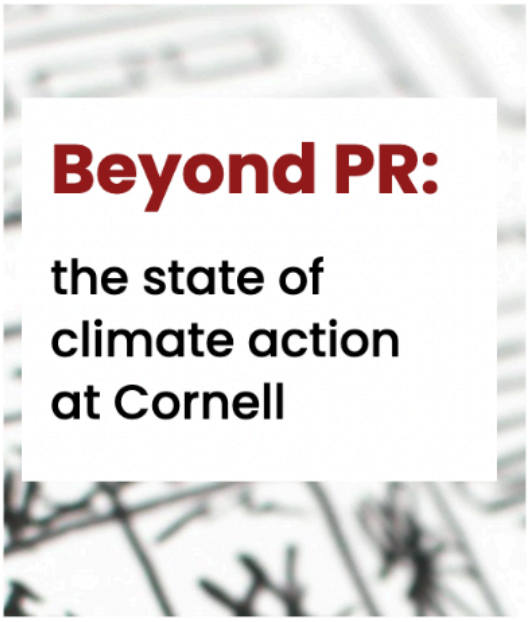
CORNELL ON FIRE



What the climate cares about: The Concerning State of Cornell's Climate Action Plan

An independent report by Cornell on Fire

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Summary for Changemakers

As climate disruption intensifies and our window of action narrows, this independent report finds Cornell University is failing to deliver on its pledged greenhouse gas emissions reductions or report that fact, while relying on inadequate strategies for future emissions reductions. This report brings together insights from experts, insiders, public data, and climate research to outline what Cornell is doing, can, and must do.

Cornell's existing Climate Action Plan is dangerously out of step with global climate goals to halve emissions by 2030, yet Cornell is failing to meet even its own inadequate plans. Despite all pledges to the contrary, Cornell has not reduced emissions since they began tracking progress in 2008, a fact obscured by their public emissions reporting. Cornell has not updated its baseline emissions reporting according to the NY State Climate Act, and it does not account for significant emissions categories including procurement and electricity sold to the grid.

Even more concerning, Cornell's key strategies to deliver future emissions reductions are low confidence. The flagship Earth Source Heat project has a 50/50 chance of success, Cornell's much-publicized renewable electricity ventures do not actively displace fossil fuels, and proposed carbon "offsets" are inherently uncertain. Meanwhile, high-confidence and equitable strategies for emissions reductions stemming from travel reduction, real-time renewables, reduced consumption, degrowth, and limits to energy demand languish on the sidelines.

Cornell's emissions reduction and climate ambition gaps are alarming. As a "polluter elite" institution, Cornell emits more greenhouse gasses than many small nations. Cornell's failure to act disproportionately harms the local community and global commons.

Ten key actions are identified that will allow Cornell to reduce emissions, reduce consumption, optimize renewables, and adopt low-carbon culture in such a way that they operate in an equitable direction for the future, not the disastrous status quo. Business as usual is the riskiest proposition on the table. Cornell must rise to serve the greatest good during this decisive decade that will determine our collective survival.

This report draws together insights from experts, insiders, public data, and climate research. The report was reviewed by multiple experts for accuracy, as noted in the acknowledgements.

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"Every decade is consequential in its own way, but the twenty-twenties will be consequential in a more or less permanent way. Global CO_2 emissions are now so high – in 2019, they hit a new record of 43 billion metric tons – that ten more years of the same will be nothing short of cataclysmic. Unless emissions are reduced, and radically, a rise of two degrees C (3.6 F) will be pretty much unavoidable by 2030. This will make the demise of the world's coral reefs, the inundation of most low-lying island nations, incessant heat waves and fires and misery for millions – perhaps billions – of people unavoidable."

-*Elizabeth Kolbert, The New Yorker, January 5, 2020*

We "miscalculate the gap between where we are at and where we would like to be, and what we would need to relinquish to get there."

-*Vanessa Machado de Oliveira, Hospicing Modernity, 2021*

1. Cornell's current Climate Action Plan is dangerously out of step with global climate goals. Here on Earth, what we do between now and 2030 is critical. Global carbon emissions must be slashed at least 50% by 2030 to meet our climate goals, and quickly reduced to zero thereafter, to avoid locking in 2C warming and pushing climate tipping points. A just transition would require that wealthy institutions like Cornell take the lead in cutting their own outsized emissions by *more than* 50%.

At Cornell, the University's Climate Action Plan is inconsistent with these goals, widely known as the "1.5 degree pathway." Instead, Cornell plans to continue powering the campus with climate-change-driving natural gas until roughly 2035, at which point they *hope* to transition to more renewable heat (see Section 8). Meanwhile, Cornell moves full-speed ahead with a polluter-elite culture of aviation-based hypermobility, campus expansion, and overconsumption of energy and material resources. Cornell's current Climate Action Plan puts us on a policy trajectory that, to cite science writer Elizabeth Kolbert's words above, will "be nothing short of cataclysmic."

We cannot wait until 2035 to slash emissions. We must do it now. And Cornell can. Just as it did for Covid-19, Cornell can revolutionize its mission and operations in response to shared threats. Cornell has everything it needs to achieve massive reductions in energy and material consumption by 2030, leading the way toward a just climate transition. **But Cornell will not succeed unless students, staff, faculty, alumni, and community members hold it accountable.**

Cornell's commitment to sustainability has already yielded triumphs. Efforts such as The CALS Green Initiative, Lake Source Cooling, composting, and The 2030 Project exemplify what can and should be done. Still, they are not enough. Below, we report what you need to know about Cornell's energy operations, consumption, and greenhouse gas emissions. We

are falling far short, but we have not yet failed. **These facts are actionable.** Taken along with a systemic approach to renewing universities through climate justice and an activated academia, they are the basis of a better future.

As participants in this system, we need not be complicit in inaction. Many individuals in Cornell's energy and sustainability units are working tirelessly towards the transition we need. But to achieve adequate progress on the relevant timescale, large-scale social mobilization and support for costly trade-offs is needed, combined with far greater transparency to reckon with the gap between Cornell's actual emissions trajectories and its climate pledges.

A. Not-so-platinum ratings: The Sustainability Tracking, Assessment, & Rating System (STARS)

Although Cornell currently receives "platinum" sustainability ratings from STARS, these ratings obscure the most relevant climate measure: actual greenhouse gas emissions associated with operations and the vast levels of energy and material consumption they represent. Cornell's "platinum" rating reflects high points on soft measures of sustainability (e.g., innovation and leadership, questionable coursework) that obscure low points on hard measures of sustainability (e.g., operations and emissions).

The latter story is anything but platinum. In 2022, Cornell operations scorecards were poor: Energy ratings were 51% of possible points; Buildings were 54%; Air & Climate was 72%; and Food & Dining was 33%, for instance. Cornell gets mostly failing grades on the measures that the climate cares about.

2. Cornell is elite – the polluter elite.

11,000 scientists issued a declaration of climate emergency in 2019, stating that "the climate crisis is closely linked to excessive consumption of the wealthy lifestyle." They could have been speaking to Cornell, with a $10 billion endowment and a carbon footprint larger than the 21 lowest-emitting nations in the world (and larger than the bottom eight *combined;* see Spotlight on Carbon Inequality). Elites like Cornell are disproportionately driving climate change with their outsized emissions: even if the rest of humanity cut their emissions to zero now, the globe's top 10% would blow through our global carbon budget by 2033.

As an elite University, we cannot escape the ethical dimensions of carbon inequality. "What the 1% do is overuse the earth's resources through extraction, hyperconsumption, a discard culture that produces enormous amounts of waste and pollution – all these processes together create significant strains to planetary systems." Yet rather than challenging carbon inequality, Cornell promotes it through all the accouterments of affluence and convenience: frequent flying, personal car culture, constant campus growth, excessive square footage, wealth accumulation, hyperconsumption, throw-away culture, and massive waste production. This comes at a tremendous cost to local and international wellbeing.

How costly is it, exactly? To answer that question, we turn to Cornell's carbon pollution as measured by **greenhouse gas emissions inventories**, aka **"GHG Inventories."** Keep in mind that when we speak about greenhouse gas emissions noted in **metric tons of carbon-dioxide equivalent (mtCO2e)**, this can be seen as a proxy for the entire system of consumption, extraction, production, toxicity, and land use that is driving Earth beyond safe planetary boundaries. Each of these human activities carries an emissions signature that shows up (when properly accounted for) in GHG inventories.

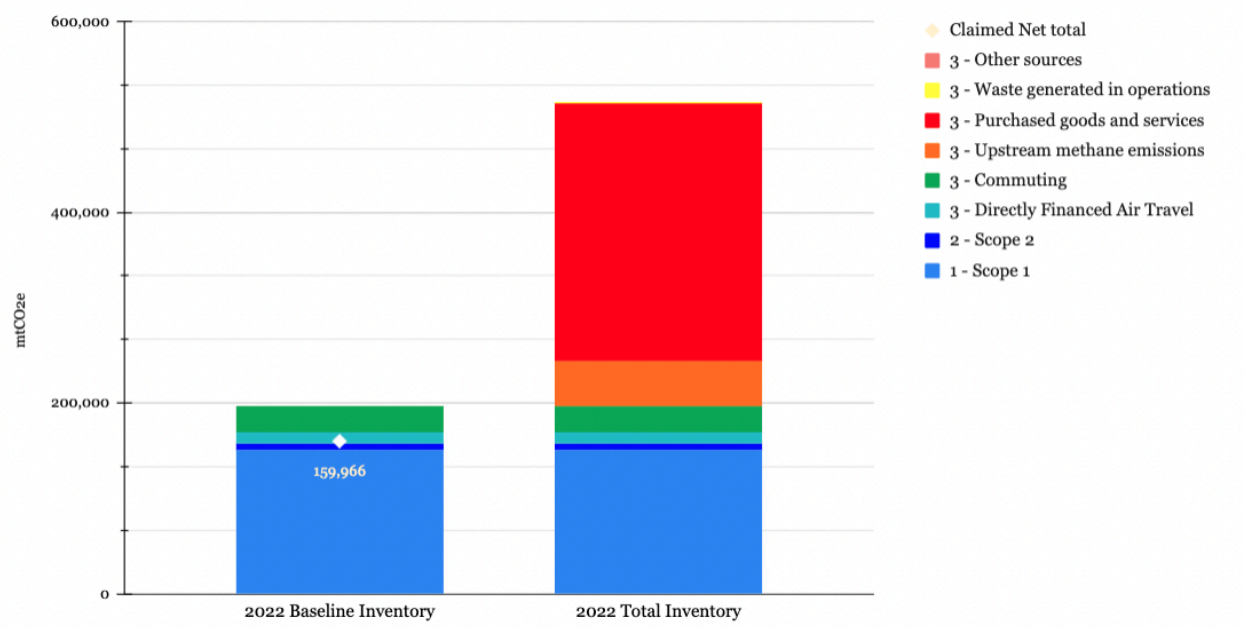
3. Cornell's carbon pollution far exceeds what is covered by its Climate Action Plan.

It's hard to grasp the full scope of Cornell's carbon emissions from their public Baseline Inventory, which reports only those emissions covered by their Climate Action Plan (compliant with the Second Nature Carbon Commitment). A fuller, but still incomplete, picture would include the emissions categories that Cornell calls their "Additional Inventory." That picture is provided in **Figure 1,** which presents all of Cornell's publicly reported emissions in one place using data from Cornell's Emissions Inventory and Disclosure to STARS. This Total Reported Emissions Inventory includes upstream methane emissions, electricity exported to the grid for sale, and purchased goods and services (aka procurement) in addition to the Baseline Inventory categories, all in GWP100.

Keep in mind that Figure 1 is still a significant underestimate of Cornell's actual GHG emissions, because they are reported in GWP100 (a concept explained below) and we could not include the sure-to-be-colossal emissions figures from investments or student travel. Like other US universities, Cornell does not report these figures publicly.

Figure 1: The gap between Cornell's Baseline and Total Reported Emissions Inventories

Figure 1: Comparison of Baseline vs. Total GHG Inventories for 2022, GWP100



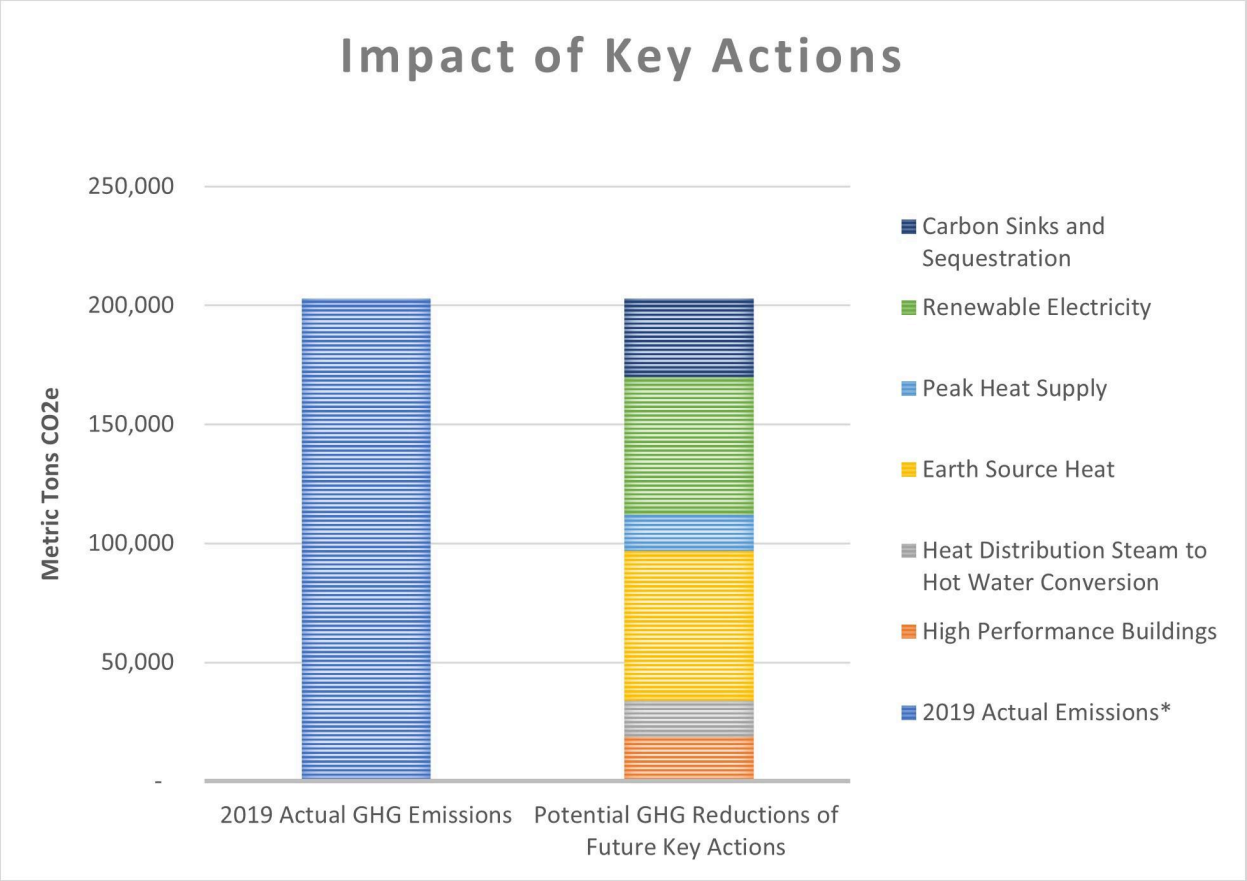
This graph shows the best estimate of Cornell's Total Reported Emissions for the year 2022 using a 100-year GWP (right), as compared to their Baseline Inventory emissions reported on the public webpage (left). This illustrates that several significant categories of emissions are not reported in Cornell's Baseline Inventory, and should be addressed as part of a comprehensive plan to reduce emissions. It is important to note that these numbers for upstream methane emissions are much larger when using GWP20, the standard required by the 2019 NY State Climate Act (see **Figure 4**).

This graph shows what a difference accounting choices can make. The casual observer would be forgiven for concluding, on the basis of Cornell's Baseline Inventory, that Cornell generated about 160,000 net mtCO2e in 2022. In fact, that net figure represents only 31% of the gross 515,000 mtCO2e that make up the full ledger of Cornell's publicly reported emissions – a figure that still excludes investments and student travel.

These accounting choices, standard for many colleges and universities under Second Nature's reporting guidelines, have a troubling real-world consequence: Cornell's Climate Action Plan only addresses a subset of predetermined emissions categories. As shown in Figure 2 below, the Climate Action Plan pledges to resolve 200,000 mtCO2e annually, a mere 40% of all reported emissions. Researchers within Cornell are pushing for increased awareness of these emissions categories and they receive mention in the 2013 Climate Action Plan. But there is currently *no publicly accountable plan in place* to reduce emissions from major categories such as procurement (which totaled an astonishing 270,261 mtCO2e in 2022) or electricity exported to the grid for profit, not to mention investments or student travel. If *comprehensive* climate action is to be taken, it will only be because the people demand it.

Accounting choices are not mere entries on a ledger – they are decisions that impact the public's understanding of, and Cornell's accountability for, major emissions categories, with direct consequences for the climate. We urge Cornell to report and take accountability for all of their Scope 1, 2, and 3 emissions in one "big-picture" inventory, following positive steps in that direction by organizations such as Google.

Figure 2: Cornell's Climate Action Plan and Key Actions address only part of their total emissions (source)



As **Figure 2 shows,** Cornell plans to carry out key actions to address an annual 200,000 mtCO2e in the years leading up to 2035, representing only those categories of campus emissions that are "included in our commitment to reach carbon neutrality by 2035." Yet their total reported annual emissions exceed 500,000 mtCO2e (figures in GWP100). The primary strategies for reducing baseline emissions are carbon sinks and sequestration, renewable electricity, Peak Heat Supply, and Earth Source Heat. Read on for up-to-date analyses of these strategies.

B. Spotlight on Carbon Inequality: To put carbon inequality in perspective: In 2022, Cornell's carbon footprint across Scopes 1-3 combined (.515 megatons, gross mtCO2e, GWP100) was larger than that reported by the EDGAR database for of each of the 21 lowest-emitting nations in the world, including Vanuatu (pop. 327,000), Dominica (pop. 73,000), Turks and Caicos Islands (pop. 46,000), and the British Virgin Islands (pop. 31,000) (population figures from the World Bank). In fact, Cornell emitted significantly more greenhouse gasses (.515 mtCO2e, GWP100) than the bottom eight countries *combined* (.454 mtCO2e, GWP100).

The corollary is that individuals at Cornell – like many in the U.S. – are emitting far more greenhouse gasses per person than the vast majority of the world. Cornell's population of "weighted campus users" (adjusting for residents and employees) was 28,308 in 2022, leading to per-capita emissions of 18.20 gross mtCO2e (across Scopes 1, 2, and 3). This figure is slightly higher than the average per-capita emissions reported in EDGAR for the average US citizen in 2022 (17.90 mtCO2e); more than double the per-capita emissions of citizens in the EU27 (8.09); and greater than the per-capita emissions of citizens from 93% of countries.

For local comparison, Cornell's 2022 carbon footprint from operations (Scopes 1 and 2, plus wastewater, ~135,000 mtCO2e, GWP100,) was over 64 times larger than the Town of Ithaca's Government operations (2,085 mtCO2, GWP100, most recent data 2019), which includes wastewater treatment, water delivery, buildings, streets and vehicle fleets combined. Similarly, Cornell's operations dwarfed Tompkins County Operations (3,107 mcCO2 in 2019, GWP100) by a factor of 43. In pollution and energy use, Cornell has a tremendously outsized impact on the local ecology. All of us are affected by Cornell's failure to act.

4. Cornell's plan for "carbon neutrality" is a dangerous trap.

A carbon-neutral Cornell by 2035 is not enough—the goal of carbon neutrality or "net zero" is a dangerous trap. To achieve local and global climate goals in line with an equitable transition, Cornell must achieve zero-carbon emissions. That means emissions actually fall to zero, as opposed to "net zero," where Cornell (on current plans) continues to emit over 30,000 mtCO2e annually that are then "deducted" in the name of false solutions (see Section 10). That also means that when Cornell pledges to power campus with renewable electricity, they actually *displace* some 50,000-plus mtCO2e of fossil-fueled electricity annually with renewable electricity – rather than continuing to power campus with natural

gas while paying solar developers for renewable energy credits on top of that (see Spotlight on Solar).

Cornell's Climate Action Plan preserves current levels of vast energy and material consumption while seeking "sustainable" ways to meet or offset that demand. The pretense is that Cornell can somehow maintain current levels of elite pollution while also meeting urgent climate goals. It cannot. The international consensus is clear and urgent: projected carbon emissions must be halved by 2030, with rapid decreases towards zero after that, and the globe's polluter elite must lead by rapidly and drastically cutting their consumptions.

Instead of reducing emissions only insofar as it aligns with its "mission," as Cornell often spins it, the priorities must be flipped. We must slash emissions by 2030 to preserve a habitable planet – and we must rebuild our mission and operations around that goal.

C. Spotlight on Solar. You might be thinking, "Wait, I just saw a headline that Cornell has reached 'its goal of powering the Ithaca campus with 100% renewable electricity.' Now you're telling me that our electricity comes from burning climate-change-driving natural gas?" Yes and yes. The realities of electricity procurement render this "100% renewable claim" – while popular among US universities– tantamount to greenwashing.

To clarify: the Ithaca campus is powered by electricity from burning natural gas, supplemented with small amounts of renewable electricity from rooftop solar and hydro. Cornell has invested money in solar farms – including one 94 miles away – that will supply electricity to the grid elsewhere when the sun is out. Cornell's claim for "100% renewable electricity" stems from the fact that their solar farm can generate as much electricity as they use on campus each year. (Occasionally it does so on a given day.) The problem with this arrangement, called "annual matching," is that it does not result in solar use displacing fossil fuel use. Instead, solar becomes another source of intermittent power layered on top of continued fossil fuel use. While there is value in serving as an early adopter of solar technology, this "is not the same as fully decarbonizing our electricity consumption."

A casual observer can confirm that solar electricity is not displacing fossil fuel use on campus because if Cornell were 100% solar, the campus would experience dips in reliability (and it definitely would not be meeting peak demand at all costs). This crucial clarification is noted in Cornell's reports: "*on sunny afternoons* Cornell is 100% renewable - in other words they generate more power in a given moment than the campus is using."

Cornell can do better. We urge Cornell to shift away from annual matching to 24-7 carbon-free electricity procurement, as other actors such as Google and the US Government have done. This approach ensures that every hour of electricity use is matched to a renewable source in real time. An hourly-matching approach "drives significantly more retirement of natural gas power plants, replacing them almost one-for-one with clean, firm capacity." It also comes at a cost premium for early adopters leading the way. With its generous endowment and commitment to the public good, Cornell is perfectly positioned to take on this leadership mantle by "investing in accelerating innovation" to make it "much easier for the broader society to follow them on the path to 100% carbon-free grids."

A solar farm that accelerates the retirement of Cornell's Central Energy Plant? Yes, please!

5. Cornell runs its own power plant – and it's cheap, lucrative, and dirty.

You knew Cornell is in the business of knowledge production, but did you know it's also in the business of energy production? The Combined Heat and Power Plant burns natural gas to "cogenerate" both heat and electricity to Cornell's Ithaca campus. It produces so much electricity that it exports some to the grid for sale. Translation: Cornell makes money off burning natural gas (and then declines to take accountability for those emissions, as explained in Section 6). There is nothing remotely clean or green about natural gas: it's composed almost entirely of methane, the second-largest contributor (behind CO2) to global warming.

This may seem counterintuitive. Why would a University run its own power plant? According to a 2022 Reuters investigation into big university polluters including Cornell: "many [campuses] operate their own plants to ensure themselves a supply of cheap and reliable power, and to avoid dependence on surrounding electric grids that often are decaying from age and underinvestment." By running its own plant, Cornell secures cheap energy and immunity from grid outages that affect the rest of Ithaca.

It also ensures that Cornell's campus is powered by, and often sells, dirtier electricity than the rest of the local grid. The New York Upstate grid is the cleanest in the country, served primarily by clean energy from hydro and nuclear. As you would expect, Cornell's gas-fired plant is significantly dirtier than the local grid on average (specifically, +300 pounds of CO2 per megawatt, 2020). But that's not quite the whole story. Natural gas plants in Upstate New York still typically serve as so-called "marginal" generators to supply electricity needs

not met by cleaner sources. Cornell's plant outperforms some of the other natural gas plants in this category, making it a less bad option for meeting marginal demand.

Of course, everyone agrees that the ultimate solution is to phase out *all* fossil fuel plants. But until we get there, is Cornell's plant helping or hurting our collective emissions reduction efforts?

The answer to that question hinges on the double-edged nature of cogeneration. Like other cogeneration plants, Cornell's plant achieves efficiencies by using the byproduct of electricity production (steam) to produce heat for campus. This is a major improvement over conventional plants that do not harness byproduct heat and means Cornell's plant may sometimes beat other generators on bang for their Btu. Furthermore, Cornell's plant has state-of-the-art catalytic controls for NOx on their combustion gas turbines. To the extent that Cornell's electricity is exported to the grid on the basis of GHG considerations rather than cost, it may reduce overall grid emissions. (And cost considerations may be critical.)

But there is a flip side to cogeneration. So long as campus requires heat, it also locks Cornell's plant into producing dirty electricity even if renewable electricity is available. The sun can shine all it wants on a cold winter day (as it did on March 7, 2020), but it will not displace fossil-fueled electricity at Cornell because the plant *must* generate electricity in order to create heat. In such cases, Cornell's plant may force electricity onto the grid even when it's the dirtiest option available.

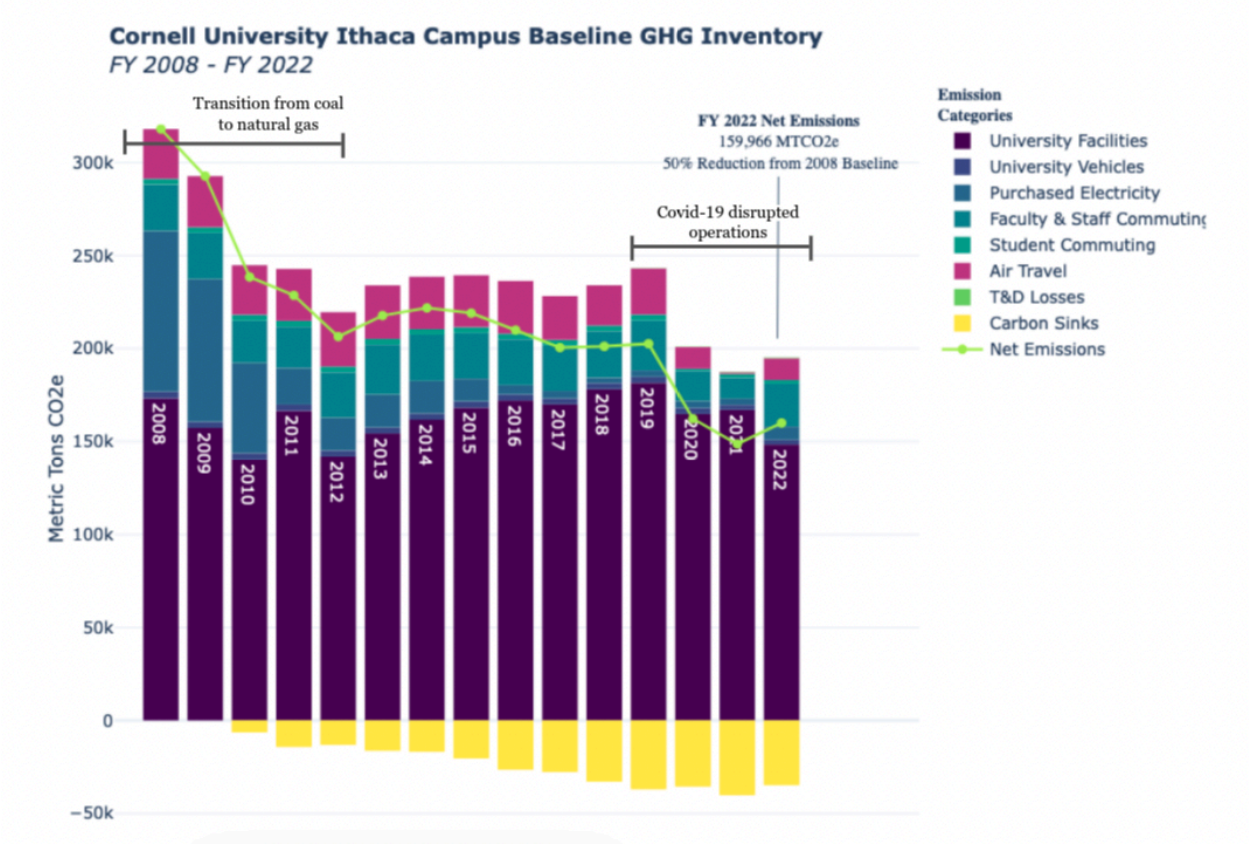
Thus, there may be a dance between campus-wide and system-wide grid emissions reductions. As long as Cornell is using its plant for heat *and* renewable electricity supply is low, it could be more efficient system-wide for the plant to sell surplus electricity to the grid. But those advantages are lost when Cornell is not using its plant for heat (think, every warm day), or when the need for heat locks in dirty electricity over renewable electricity (think, every sunny cold day). The experts we spoke with emphasized the need to make grid export decisions on the basis of GHG emissions rather than profit, and to power down Cornell's plant when heat is not needed. Most urgently, they emphasized the need to begin rapidly phasing out natural-gas operations to achieve tandem campus-wide and system-wide emissions reductions.

> "Campuses have an obligation to be leaders here, not followers. Every day that students see an old-school power plant, they're being educated about the past, not the future."
> -Bill McKibben, quoted in Reuters, Nov. 11, 2022

6. Cornell underreports its greenhouse gas emissions from natural gas.

In 2009, Cornell's campus transitioned from coal to natural gas with the goal of reducing greenhouse gas emissions. At the time, natural gas was lauded as a "bridge fuel" for the energy transition. Tragically, we now know that natural gas is as bad as coal. You wouldn't know that from looking at Cornell's Baseline Inventory, however (**Figure 3**). It shows a steep drop in emissions from 2008 to 2012, reflecting the campus transition from coal to natural gas, which Cornell's Sustainability website claims is "lower-carbon energy." This is false and misleading, according to Professor Robert Howarth. We now know that the "decline" in GHG emissions is illusory due to unaccounted upstream methane emissions from natural gas and underestimates of methane's severe global warming potential.

Figure 3: Cornell's Baseline Inventory suggests GHG "reductions" from the transition from coal to natural gas (source)



From the Cornell Sustainable Campus website, Cornell's baseline greenhouse gas inventory "measures the categories of emissions from the Ithaca, NY campus included in our commitment to reach carbon neutrality by 2035. Emissions from all six greenhouse gases are measured and translated into metric tons of carbon dioxide equivalent, and reported using the Second Nature and GHG Protocol methodology." Brackets are added noting

the driving factor behind two sustained periods of emissions reductions: the transition from coal to natural gas (2008-2012), and Covid-19 disrupted operations (2019-2022).

Cornell on Fire spoke with experts including Cornell Professors Robert Howarth, Edwin A. Cowen, and Anthony Ingraffea, all of whom argued that Cornell needs greater transparency on methane emissions reporting. At issue is the reporting of upstream methane emissions and their global warming potential. **"Upstream methane emissions"** refers to methane leakage that occurs when natural gas is produced, stored, processed, transported, and used, including emissions released outside state boundaries. In Cornell's case, as with the rest of New York, that would predominantly include emissions from shale gas extraction in Pennsylvania. "**Global warming potential" (GWP)** is a method of accounting for methane's greenhouse gas contributions to global warming across different time horizons. According to growing scientific consensus, traditional means of accounting for GWP on a hundred-year horizon (**GWP100**) should now be replaced with a twenty-year horizon (**GWP20),** to better account for the most severe near-future impacts of methane.

To drop the technical "GWP" jargon and use a simplified analogy: Imagine you're getting into a hot tub from which you cannot emerge. The control dial lets you calibrate a comfortable water temperature 100 minutes from now – without mentioning that it will first reach a boiling point at some point in the first 20 minutes. This would not be a very informative dial. A much better dial would allow you to calibrate the temperature for the most critical period so you can survive to reach 100 minutes and beyond. There is no dial for Earth, but this analogy points to why we should care about methane's impacts on a near-future time horizon: we need to calibrate our emissions reductions today to avert peak global warming effects on the timescale that matters most for our climate goals.

For that reason, experts have been urging Cornell for years to report its upstream methane emissions as part of its Baseline Inventory and use a 20-year GWP. In response to expert advocacy, in 2016 Cornell issued a report recommending the new reporting metrics. The Cornell Sustainability Office briefly changed its standards of Baseline Inventory reporting by including upstream methane emissions and using GWP20. One year later, for unknown reasons, the reporting method was reversed. (Ironically, Cornell is cited as a model in an academic article at that time by Professor Howarth.)

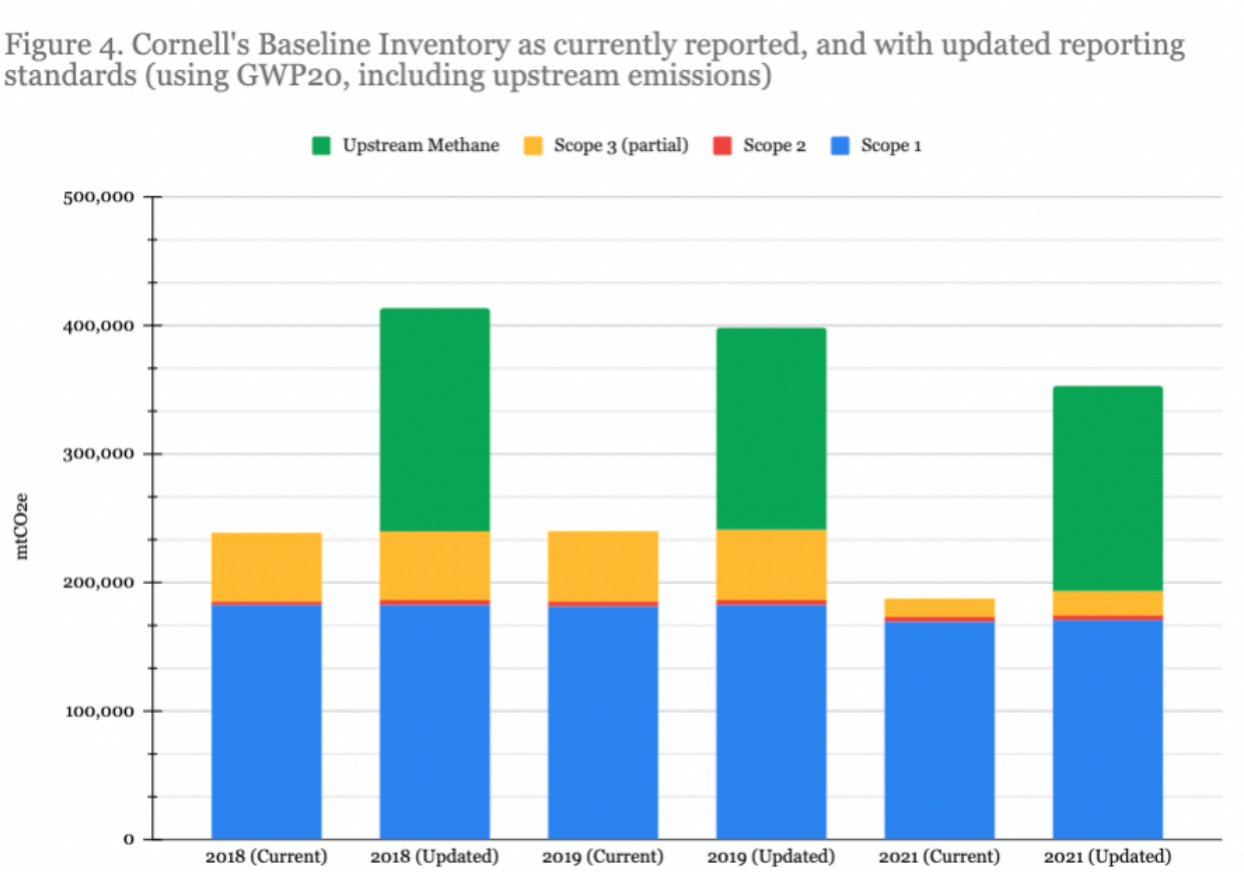
Years later, in May 2020, a working group led by then College of Engineering Dean Lance Collins submitted a recommendation to the Carbon Neutral Campus Steering Committee, which reports to the Sustainable Cornell Council Leadership, a recommendation that Cornell report its upstream methane emissions using a rate of 3.6% and both the GWP20 and GWP100 values for methane. The working group did not fully endorse the proposed leak rate, with dissent coming from Cornell Energy and Sustainability staff. The working group asked Professor Cowen to review the May 2020 report and formal dissent document

submitted by Cornell Energy and Sustainability staff. In May 2021, Professor Cowen submitted an MOU to the Carbon Neutral Campus Steering Committee accepting some of the arguments from each party, and reducing the recommended upstream methane leakage rate to 3.3%.

Meanwhile, in 2019, New York's Climate Leadership and Community Protection Act (CLCPA), aka the Climate Act, issued new reporting requirements to include upstream out-of-state methane emissions and use GWP20. Cornell is subject to those laws as a recipient of state funding. They also constitute "bespoke requirements" for updated reporting under the IPCC Report 6 cited by Cornell's Sustainability Office. Tompkins County and the Town of Ithaca have both adjusted their GHG inventories to reflect these metrics.

Yet Cornell's Baseline Inventory (see **Figure 3**) continues to omit upstream methane emissions while using the traditional GWP100 accounting method, making no mention of the fact that significant emissions are excluded. Instead, those emissions reports are tucked away on a webpage called "Additional Inventory" with a jargon-filled explanation of what the numbers mean. To help the public better understand Cornell's emissions, **Figure 4** presents Cornell's Baseline Inventory emissions as they should be reported according to New York State's Climate Act and the recommendations of Cornell's own faculty experts. As is clear, Cornell's current Baseline Inventory accounting method significantly underestimates the scope of carbon pollution. For instance, the Baseline reports 201,000 net mtCO2e for 2018 (234,000 gross) while updated accounting measures total 413,000 gross mtCO2e. Including the most recent estimates for procurement emissions would bring Cornell's total reported emissions for 2018 to an estimated **760,000** mtCO2e.

Figure 4: Cornell's GHG Emissions as they should be reported under New York's Climate Act (CLCPA)



"Current" bars display emissions from recent years as currently reported in Cornell's Baseline Inventory (using GWP100, excluding UME). "Updated" Bars report the same categories according to updated CLCPA standards (including UME figures from Cornell's Additional Inventory, and using GWP20 across all reported scopes), as experts argue should baseline emissions should be reported. (Note: Data were drawn from SIMAP reports. One category of Scope 1 emissions, refrigerants and chemicals, could not be converted into GWP20 and is reported as the same value in both bars.) Note that the GHG estimate for methane emissions is higher when using the GWP20 as opposed to the GWP100, even for the same amount of methane emitted.

Cornell's Baseline Inventory may be compliant with Second Nature's reporting standards, which are silent on this pivotal issue, but it no longer reflects either scientific or New York State consensus. Ironically, Dr. Howarth noted that he has met with more success in advocating for updated emissions reporting standards at the New York State level than at Cornell. Why doesn't Cornell follow the most advanced reporting guidelines?

Cornell's Sustainable Campus page implies that these new emissions estimates are not included in the Baseline Inventory because they are not directly comparable to baseline years (chiefly 2008) due to changes in accounting methods. For instance, there is some uncertainty around precise upstream emissions from Cornell's coal and imported

electricity from the grid in 2008. There is no uncertainty, however, about the bigger picture: "An abundance of scientific evidence now…shows that natural gas is at least as damaging to the climate as coal and may be worse due to inevitable leaks of unburned methane." An inability to precisely report upstream emissions from coal and grid electricity in 2008 should not prevent Cornell from accurately reporting methane emissions now. Cornell should follow the lead of other New York entities including Tompkins County and the Town of Ithaca, who have deftly implemented and communicated the new reporting standards.

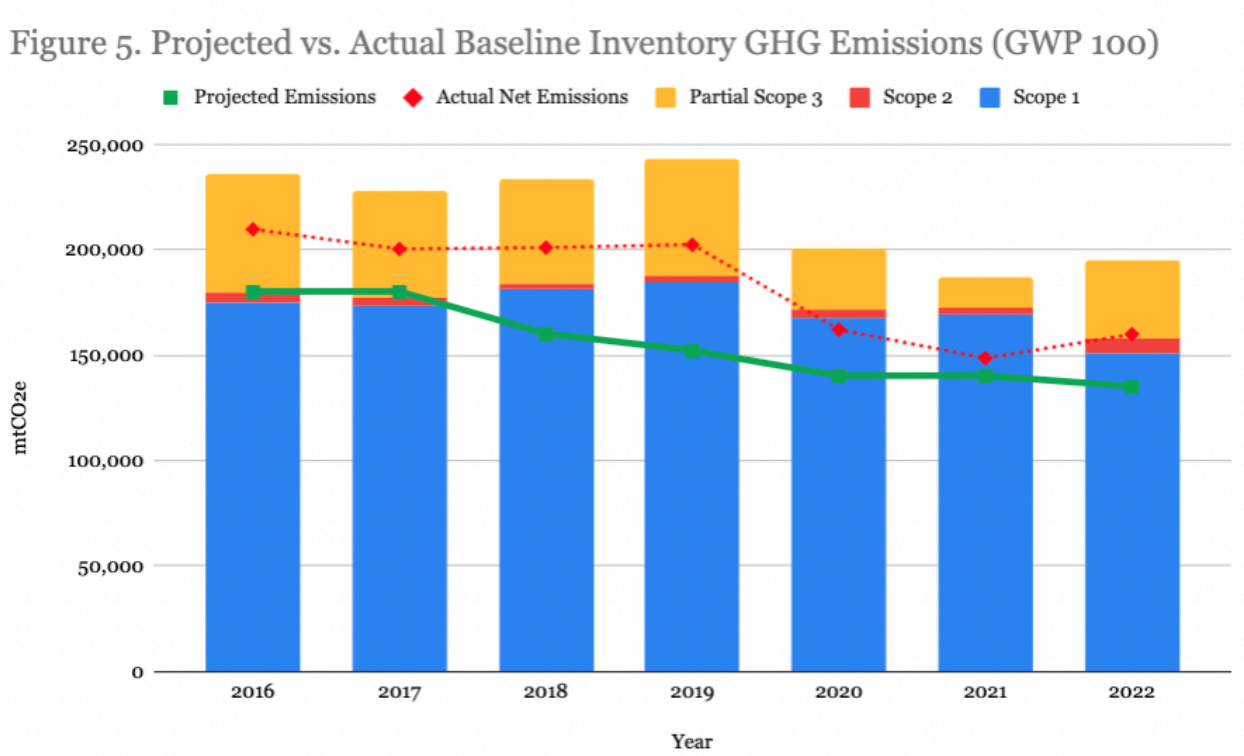
There is another twist when it comes to underreporting emissions. Cornell's power plant exports energy to the grid for sale, but declines to account for those emissions on their own public GHG inventories, where the figures are deducted from the net total as "carbon sinks" (to the tune of 25,000 mtCO2e per year, GWP100). The numbers appear in Cornell's operations reports to STARS, where the deduction is justified by stating that it "represents the emissions associated with this energy not used on campus." Multiple experts we spoke to agreed that these emissions should be included in Cornell's Baseline Inventory under Scope 3. After all, Cornell is producing, selling, and likely profiting from this electricity. Additionally, Cornell does not report the amount of methane leaked on-site at the Central Energy Plant, although this figure is known and can be tracked (by calculating the difference between the amount of gas purchased and the amount of gas burned). It can also be smelled. Take a tour of the plant!

7. Cornell is falling behind its Climate Action Plan goals – dramatically.

Cornell has pledged steep reductions of greenhouse gas emissions to achieve carbon neutrality by 2035. Whatever way you slice it, they are falling behind.

Comparing Cornell's reported Baseline Inventory to their Climate Action Plan Roadmap reveals that emissions reductions are not happening as quickly as planned, even on their own accounting methods (see **Figure 5)**. To be on track for carbon neutrality by 2035, Cornell's Projected Campus Emissions for 2022 needed to be 135,000 (net) mtCO2e. Instead, Actual Campus Emissions reported for 2022 were 160,000 (net) or 195,000 (gross) mtCO2e (GWP100). Indeed, since the initial "drop" in emissions due to the transition from coal to natural gas (an illusory drop), University emissions have flatlined, with the exception of temporary reductions reflecting Covid-19 disrupted operations.

Figure 5: Cornell's emissions reductions are lagging behind projected goals



This graph shows Cornell's projected emissions reductions as outlined in their 2013 Climate Action Plan & Roadmap (green line) compared to actual gross and net emissions as reported on their Baseline Inventory. Projected values are estimates. Performance figures were drawn from the Baseline Inventory on the Sustainable Cornell webpage. Note that these figures reflect Cornell's own Baseline Inventory accounting methods, so they exclude significant emissions categories and use traditional reporting standards (GWP100, excluding upstream methane emissions).

And the big picture is even more troubling: After properly accounting for methane's twenty-year global warming potential and upstream emissions from burning natural gas, as shown in Figure 4, Cornell's GHG emissions have not decreased at all, and may have actually *increased* since 2008.

Consider the implications. Since Cornell launched its ambitious Climate Action Plan pledging steep emissions reductions in 2008, overall greenhouse gas emissions have at best remained constant, or may have even *increased*.

This can be attributed to persistent failures to make costly tradeoffs in the name of climate. Instead of slashing emissions, Cornell continues to construct new buildings, build new gas infrastructure, bristle at the City of Ithaca's Green Building code, spend millions of dollars

on flights, hoard wealth in the endowment, and generally behave as if emissions reductions were a distant secondary consideration.

D. Campus expansion prevents emissions reductions. Cornell's Sustainability webpage cites a curious credential: "Energy use has remained flat since 2000 in spite of a 20%+ growth in campus square footage." Fewer emissions per square foot, aka efficiencies, are necessary but not sufficient. As Dr. Ingraffea says, "The climate doesn't care about efficiency." (Efficiencies have well-documented rebound effects of increased resource consumption, known as the Jevons paradox.) Furthermore, our climate goals hinge on reducing, not flatlining, emissions. Building more buildings, even efficient ones, makes it harder to reduce energy and material consumption now and in the future. As Cornell Vice President of Energy and Sustainability Robert Bland says, "Negawatts – not Megawatts!" Campus expansion directly counters the imperative for **degrowth** mentioned over 20 times in the latest IPCC full report (but excluded from the watered-down Summary for Policymakers).

Cornell's seemingly endless building spree contributes to its failure to meet Climate Action Plan goals. Over the last decade, Cornell added nearly a million square feet of space with the construction of Gates Hall, Bowers Hall (planning completion in 2025), and no less than five new residence halls on North Campus.

The North Campus expansion in particular was a lost opportunity for decarbonization. Community commenters during the environmental review argued for enhanced energy efficiency of the proposed buildings using rapidly improving building technologies (e.g., advanced insulation materials, high-performance windows) and highly energy-efficient cold climate heat pumps. In the same time period Cornell Tech was constructed in NYC, achieving the LEED Gold standard and becoming one of the largest net-zero buildings in the US. This established that Cornell could construct such buildings if it chose to do so. On North Campus, it did not. Cornell chose less efficient buildings and natural gas heating infrastructure. Cornell should prioritize GHG emissions reductions in all building projects and renovations by requiring a Life Cycle Assessment of greenhouse gas emissions and adherence to the progressive Ithaca Energy Code Supplement.

As a current case in point, Cornell is in the planning stage as it seeks to build a 200-unit housing development on Tareyton Drive in Ithaca, on wetlands abutting the beloved Sapsucker Woods and home of the Cornell Lab of Ornithology. The potential for habitat destruction seems anathema to Cornell's climate change efforts. It also begs the question:

If Cornell claims carbon "offsets" from soil sequestration, will they claim carbon emissions from habitat destruction?

We urge Cornell to shift its spending priorities away from campus expansion and towards the energy transition. An oft-cited objection (believe it or not) is that donors want to put their names on new buildings. An academia for the future would honor its climate goals while honoring donors by putting their names on building retrofits, energy transition infrastructure, preserved green spaces, and climate justice initiatives.

Meanwhile, Cornell's Sustainability Office asserts that Cornell is "on track for carbon neutrality by 2035." Cornell has not publicly reported the lag in their own Climate Action Plan goals, nor has it reviewed progress on the promised schedule. According to Dr. Howarth, Cornell planned to conduct a review in 2021 to determine progress towards carbon neutrality. Among other objectives, this would assess whether changes in natural gas usage are on track to meet our goals, as well as progress towards Earth Source Heat so that Cornell can pivot if needed (see below). The COVID-19 pandemic interrupted this review and Howarth was unaware of any progress on that front. If the review has been conducted, it has not been well communicated.

Currently, there are only a handful of full-time staff dedicated to Cornell's Climate Action Plan, serving a campus population of nearly 30,000 (weighted) users. At bare minimum, far more resources and staffing power should be put into this mission-critical project.

Every expert we spoke with emphasized that periodic reviews of progress, combined with active updates of Cornell's climate goals in line with the rapidly changing climate situation, are crucial for maintaining transparency and ensuring adequate action. This transparency can in turn fuel healthy public engagement, debate, and social mobilization.

8. Cornell's flagship emissions-reduction strategy will come too late – if it comes at all.

The ambitious Earth Source Heat project intended to drive Cornell's transition to renewable heat is a worthy research project, but an increasingly tenuous engineering solution. Now about ten years in, **Earth Source Heat (ESH)** is still in the research phase. It remains to be seen if and when it will move to the implementation and engineering phases. Cornell Professor Anthony Ingraffea, an expert consultant on ESH, told Cornell on Fire that the odds of success are "at this time in the project at best 50/50." Despite that uncertainty, Cornell has a lot riding on this project.

The inherent uncertainty of a research project on this scale renders the timeline for implementation ambiguous. The problem is, our timeline for emissions reductions is not. Even if it succeeds, ESH will come online too late to help with the critical goal of massive emissions reductions by 2030. It was originally projected to begin operations around 2030, a date now pushed back to 2035 on one estimate. Professor Ingraffea estimates that the *very best possible* outcome, requiring "the best-case circumstances of technological availability, financial backing, good weather, and good luck," would see an operating system that supplies ESH to a substantial portion of campus by 2029.

Cornell needs a plan to reduce energy consumption prior to 2030 while waiting for ESH to come online. Cornell's power plant cannot continue belching out thousands of tons of carbon pollution from natural gas while it waits to see if ESH works, spinning its turbines while other emissions reductions strategies "stagnate" (in Ingraffea's words).

If Earth Source Heat is a bust, Cornell's backup plan is Ground Source Heat Pumps (GSHPs). Unlike ESH, this is a proven technology already being used on other campuses, such as Princeton, to move away from fossil fuels. These devices are less efficient than ESH and require more electricity for the same amount of heating, but are still more efficient than many other technologies.

Here's the rub: Ground Source Heat Pumps and Earth Source Heat require significantly different infrastructure. Cornell will need to decide between these two technologies well in advance of the relevant deadline to allow for installation of the appropriate infrastructure. If Cornell is going to meet international climate goals to halve emissions by 2030, then a public timeline for decision-making around ESH and contingency plans must be rolled out immediately. Additionally, without community pressure, there is risk that decision makers within Cornell may not be willing to make a timely investment in either of these solutions.

Earth Source Heat is a keystone of Cornell's Climate Action Plan, and is justly heralded as a transformative research project. What's missing is frank acknowledgement that the chances of success are 50/50. What's needed is clear public communication and debate about the success and risks of Earth Source Heat, timelines for infrastructural decisions at a pace consistent with climate goals, and aggressive pursuit of alternative emissions reductions pathways in the meantime. Anything else is speculative gambling with our collective future.

9. Cornell's mantra must shift from "we must always meet energy demand" to "energy demand must meet our climate goals."

Cornell's power plant mantra, like the rest of the US power grid, holds that "we must always meet energy demand." As noted above, Cornell has focused on purchasing enough solar renewable energy credits to match its consumption on an annual basis. Its actual

operations, meanwhile, are unchanged, geared at meeting demand at all costs – including costs to our climate goals. Cornell has the ability to implement a new mantra, "energy demand must meet our climate goals." This would entail a different approach to peak demand and unlimited energy supply.

Like the rest of the grid, Cornell generates tremendous emissions to meet "peak" demand – time periods when there is unusually high demand for power, such as hot summer days with excessive air conditioning. To meet peak cooling demand, Cornell fires up extremely dirty "chillers" as a supplement to the cleaner Lake Source Cooling system. But peaker plants are not a solution: they are one of the problems accelerating climate change, are subject to looser regulations than baseload plants, and serve as a crutch for untenable expectations for unlimited energy. Nonetheless, Cornell remains fixated on meeting peak demand at all costs. The Climate Action Plan involves elaborate strategizing around peaking, including preserving the existing power plant (read: natural gas), or perhaps using manure or biomass, as a peak heat source.

The alternative to peaker plants is simple: reduce demand as it approaches peak. This can be accomplished through demand-side changes, such as informing consumers that the grid is stressed and asking them to do their part to power down. It can also be accomplished through policies such as load management or load "shaping," intermittency, and interruptible load agreements. These mechanisms offer a suite of strategies that allow designated systems to be shifted or turned off temporarily as needed. Did you know that there are renewable passive buildings with fully-functioning research programs that can power down partially when it's cloudy? Cornell could lead the Ivies by designing a responsive energy grid that combines consumer information programs with hard-wired load management mechanisms to collectively, collaboratively "power down" when demand is reaching dangerous levels.

The jargon may be technical, but this energy use shift would be fundamental. What it means is that we respond to Earth rather than demanding that the Earth respond to us, *at all costs*. The conventional fixation on short-term energy reliability is sacrificing long-term energy reliability and our climate goals. The myth of unlimited energy supply is false and has only perpetuated inequity. By implementing flexible demand strategies for a responsive grid, Cornell can reduce and shift demand to avoid the need for peaker plants and better optimize time-matched renewable sources.

As well-respected climate journalist Sammy Roth puts it, "What's more important: Keeping [all] the lights on 24 hours a day, 365 days a year, or solving the climate crisis?" Shifting expectations around "reliability" would accelerate an equitable transition away from fossil fuels. But according to one expert, "we haven't really gone through that exercise yet."

Cornell can and should take on this worthy exercise, accepting limits to energy consumption and synchronizing its energy demand to our climate goals while writing these into policy decisions.

> "Taking a few incremental measures may feel good, but these are unlikely to have much real impact. There is really no alternative to drastic changes in our economic systems and strategies, which also involve significant reductions in inequality. We can keep talking around this, but unfortunately nature and the planet are not listening, they respond only to our actions."
>
> -The Guardian, Nov. 22, 2023

10. Cornell has no plan to bring aviation and transport emissions to zero.

To meet our global climate goals in a just manner would require that carbon emissions come down to 2.1 tons per person per year by 2030. A single intercontinental flight easily blows through that budget (emitting anywhere from 2-5 mtCO2e). At Cornell, travel emissions comprise a large portion of overall GHG emissions (at least 12% of the Baseline Inventory for faculty alone). The impact is not limited to campus. Cornell actively lobbies for expansions to Tompkins County Airport to deliver easier access for university travelers, at the same time as climate experts object to airport expansion in the absence of feasible mitigation strategies for aviation emissions.

Students, staff, and faculty continue to fly around the world at unprecedented rates, as if in systematic denial of carbon emissions. Far from reducing flight travel, Cornellians are taking off at record levels. Fall 2023 saw unprecedented rates of travel by Cornell faculty and staff leading to delays in travel reimbursements, mirroring a wider surge that led to the busiest air travel day in American history. This is the same fall that the world temporarily hit a dreaded 2C warming above pre-industrial levels. **What are we doing?**

Cornell's response to flight emissions has been a little-known voluntary Low Carbon Air Travel Pilot program that gives nearly as much weight to false solutions (carbon offsets) as it does to ending emissions (avoiding flights). Carbon offsets are an inadequate solution for flight emissions even when implemented through contributions to great local partners. One problem is that they become a "license to pollute," and moral licensing often has the unintended effect of increasing harmful behavior rather than reducing it. As social scientists explain, "individuals want the credit for moral intentions without having to pay the costs." Linked to this, a recent *Science* publication expressed strong concern that "paying to pollute may reduce the moral misgivings of firms and elites about polluting."

Ironically, the voluntary pilot program makes it clear that participants are "not committing to implementing any specific actions." It also emphasizes that the goal is to find "sustainable paths forward without sacrificing the mission and values of our institution." Are we to infer that Cornell is willing to sacrifice our collective climate goals to its "mission" as defined by the hypermobile status quo?

Troublingly, the Climate Action Plan implies that the answer is yes. Instead of slashing travel emissions, Cornell proposes to "offset" these and other so-called "unavoidable emissions" with as yet unspecified "carbon sinks and sequestration." Expert Peter Montague from the Science and Environmental Health Network provided Cornell on Fire with a policy brief addressing Cornell's offset plan. He concludes that:

> "generalized plans to rely on soil carbon sequestration to "offset" CO2 emissions elsewhere are inherently subject to critical scientific unknowns and uncertainties… Before a university commits to such an enterprise, it would seem prudent and intellectually honest to publish a *detailed* plan that addresses [these] documented problems (and perhaps others that might be revealed by public comments on such a plan)."

As an institution and as individuals, we must reckon with the fact that academia's current culture of aviation-based hypermobility is directly at odds with our climate goals while directly funding the fossil fuel industry. Following peer institutions across Canada and climate science movements across the world, Cornell should create a public, policy-driven plan to reduce student, staff, visitor, and faculty emissions from air travel and ground transport. Local mobility is a huge part of the picture as well. Cornell should also throw its support behind an electrified and expanded FreeCAT bus system, to dramatically reduce campus commuting emissions and serve climate justice.

It is sometimes argued that junior faculty and graduate students need to travel for success. Recent research suggests otherwise, with one study showing that beyond a minimum threshold, success is not correlated with more travel. Among many young scholars there is an overwhelming desire to fly less. Indeed, the experience of Covid-19 at Cornell confirmed the benefits of less travel for many individuals. Capitalizing on these benefits, Cornell could support faculty and staff in communicating Cornell's climate priorities to entities that refuse virtual participation.

The last 50 years of academic hypermobility are increasingly obsolete with advances in video conferencing and accelerating climate devastation. Rather than perpetuating outdated norms of hypermobility, we urge Cornell to attract scholars and students by demonstrating real climate leadership, building thriving cross-campus and regional face-to-face collaboration networks, and adopting a low-carbon culture that incentivizes groundedness (consistent with many people's values and, not least, climate science). At the

level of professional organizations, Cornell can leverage its prestige to advocate for regional hubs and virtual participation in conference organizing. In doing so, Cornell will join other leading universities that are rewriting social norms around carbon-intensive behavior. In making these changes, Cornell can draw inspiration from their own radical leadership during the Covid-19 pandemic.

11. Continued inaction is the riskiest proposition on the table.

Against all pledges to the contrary, Cornell has not reduced emissions since they began tracking progress in 2008. What's more, the Climate Action Plan's key strategies to deliver future emissions reductions are tenuous. Earth Source Heat has a 50/50 chance of success, renewable electricity is not actively displacing fossil fuels, and proposed carbon offsets are highly problematic. Meanwhile, high-confidence and equitable strategies for emissions reductions from travel reduction, reduced consumption, degrowth, and limits to energy demand languish on the sidelines.

Each additional year of business as usual at Cornell is projected to emit well over 700,000 mtCO2e while foreclosing on critical windows of opportunity for climate transition. Cornellians, the community, and the planet cannot afford this inertia. Given mortality estimates of one future excess death for every 1,000 to 4,000 mtCO2 emitted, Cornell will be responsible for killing at least 175-700 future humans every year. That is an underestimate, because it excludes emissions from investments and student travel, among other things.

We can change the system to meet our climate goals. This will require systemic transformation based on dramatically reduced consumption of energy and materials in all sectors combined with the wise use of existing technologies, rather than trivial "sustainability" changes at the margins, speculative technologies, and controversial "off-sets" (see below). One pragmatic way to ensure this shift in priorities would be for Cornell to charge itself a hefty carbon pollution fee. We urge Cornell to join leaders like the University of California by charging itself a carbon fee for every ton of ongoing carbon pollution and using the money to cut emissions, accelerate the energy transition, support climate justice, and fund the community. Carbon pollution fees could effectively mobilize Cornell's $10 billion endowment to invest in the world's ultimate bottom line: a livable future. In so doing, Cornell can begin to honor Indigenous principles of right relationship with Earth by taking no more than it needs and giving back as much as it takes.

To close with the words of Professor Ingraffea, "Cornell needs to reduce emissions, reduce demand, and increase renewables in such a way that they operate in a direction for the future, not a direction for the status quo, as they are doing now." Cornell's 2030 Project

reminds us that this is the "decisive decade." Will Cornell rise to the occasion, or will the 2020s become the lost decade?

We are all involved. Cornell will not meet its climate goals unless students, faculty, staff, alumni, and community members hold them accountable.

Let's do so. **This is our one and final world.**

"Inch by inch progress will not do. It is time for a climate ambition supernova in every country, city, and sector."

-UN Secretary General Guterres, November 2023, referring to the urgent need to close the climate ambition gap

E. Ten key actions Cornell can take to meet its climate action goals in time

1. **Be honest about the scope of the problem.** Report the Baseline Inventory according to NY State guidelines for methane emissions. Present a Full Inventory that combines all reported emissions categories in one place. Acknowledge the gap between emissions reduction pledges and performance, noting that emissions have not reduced since Cornell launched its Climate Action Plan in 2008. This will convey the scope and urgency of Cornell's contributions to climate change and the deep changes needed.
2. **Accelerate the Climate Action Plan and begin phasing out fossil fuels now,** pursuing high-confidence and equitable pathways to halve emissions by 2030 while waiting to see if Earth Source Heat works. See points 3-10.
3. **Charge itself a carbon fee for pollution.** Join leaders like the University of California in charging a carbon fee for every ton of ongoing carbon pollution. Use the money to cut emissions, accelerate the energy transition, support climate justice, and fund the community.
4. **Accept limits to energy supply in the name of climate.** Enact a responsive microgrid that enables people and buildings to use power when it's available and power down wisely when load is high, rather than supplying peak demand at all costs. The new mantra: "Energy demand must meet our climate goals."
5. **Power campus with renewable electricity in real time.** Commit to 24-7 carbon-free electricity procurement to ensure that Cornell's use of renewable

electricity actively displaces fossil-fueled use while accelerating innovation toward 100% carbon-free grids for all of society.

6. **Celebrate a big enough campus - stop expanding.** New buildings generate tremendous emissions from construction and materials while making future emissions reductions harder. The IPCC calls for degrowth and climate goals call for "negawatts, not megawatts!"
7. **Reduce consumption of energy and material resources through *reduced consumption*, not just "efficiencies."** Buy less, use less, discard less, research in less intensive ways, share more, and make these into policies.
8. **Build a culture of climate-adapted mobility - travel and commute less, with lower-carbon means.** Flying is the number one way academics directly contribute to climate change, and campus commuting rivals that. Lead the transition to low-carbon academic culture through regional hubs, videoconferencing, and local scholarship, while incentivizing EVs on campus and funding an electrified and expanded FreeCAT bus system.
9. **Stop selling fossil-fuel-powered electricity to the grid for profit and be transparent.** The electricity that Cornell's power plant exports to the local grid may be profitable, but it also generates greenhouse gas emissions and delays the transition to a carbon-free grid. As part of a rapid phaseout of the natural gas plant, begin exporting electricity to the grid on the basis of GHG emissions rather than profit and report so transparently.
10. **Make every decision through the lens of the climate emergency.** Cornell's quadruple bottom line is noble, but it fails to acknowledge the need for costly tradeoffs in the name of climate. Cornell's mission will be meaningless if we fail the greatest challenge of our time. Rather than sacrificing climate goals to outdated and inequitable carbon-intensive notions of its mission and values, Cornell must rebuild its mission around viable pathways to a livable planet.

This list is not exhaustive. It highlights our key findings on the Climate Action Plan, greenhouse gas emissions, energy operations, and resource consumption. The full suite of emissions reduction strategies will call for changes to activities such as food, investments, waste, and land use. More broadly, climate justice, societal leadership, and climate education call for systemic change in other dimensions. See Our Demands.

"Through example and the bully pulpit, we will educate the state, the nation and the world."

-*President David Skorton, Cornell Chronicle, January 18, 2010, referring to pledges to reduce the campus carbon footprint.*

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Corrections

This report was amended on March 5, 2024. In an earlier version of this report, the updated CLCPA emissions were incorrectly reported (Figure 4). The correct emissions as reported by CLCPA would be roughly two (not three) times higher than Cornell's currently reported Baseline Inventory. Those figures, and other figures based on them, have been updated wherever they appeared in the report (Sections 6, 11).

Also, it was clarified that Cornell deducts grid export from their net (not gross) emissions (noted in Section 6, removed from Box E).

Finally, Cornell emitted more than each of the lowest-emitting 21 (not 22) world nations in 2022 (Section 2, Box B).

Updates

Figure 1 was updated with an additional data point (net emissions) and Figure 5 was added for the first time (March 5, 2024).

Some values have been rounded for consistency in significant digits, and net values were reported where relevant (March 5-6, 2024).