Climate Action, Sustainability, and Energy Committee Meeting Minutes
September 26th, 2022
2:00pm
Zoom: https://virginiatech.zoom.us/j/83324864872?from=addon

Present: Blake Bensman, Rob Lowe, Pat Donovan, Kas Church, Rachel Maizel, Mary-Ann Ibeziako (Chair), Annie Lawrence, Amy Hogan, Nick Woods for Ken Miller, Nick Quint for Jeri Baker, Todd Schenk, Dana Hawley, Rosalba Ledezma for Liza Morris, Gia Ha, Jon Clark Teglas for Chris Kiwus, Jamie King, Emily Vedder for Zhuo Fu, Katie Smith, Rachel Kohl for Wesley Gwaltney

Absent with Notice: Gwyneth Martin, Dean Paul Winistorfor, Scott Nachlis, Madison Betts

Absent: Nathaniel Humphreys, Lilian Prins, Princess Merritt, Claudia Budzyn

Guests: Kristina Cook, Jack Leff, Emily Vollmer, Nathan King, Sean McGinnis, Barbara Wise, Bernie Schaffler, Lowell Jessee, Steve Durfee, Chris Wise, Elaine Wilks, Autumn Timpano, Gregg Shively, Simona Fried, Eli Meyer, Yugasha Bakshi, Jamie Lau, Ted Faulkner, Jennifer Benning, Larissa Gimmy, Matt Stolte, Paul Ely,

Mary-Ann Ibeziako called the meeting to order at 2:00 pm. A quorum was present.

1. Adoption of Agenda

A motion was made and seconded to adopt the agenda. The motion carried.

3. Presentation

Mary-Ann Ibeziako (AVP of Infrastructure and Chief Sustainability Office), Nathan King (Campus Sustainability Manager), Jack Leff (Sustainability Office Graduate Assistant), Emily Vollmer (Sustainability Coordinator), and Bernie Schaffler, Elaine Wilks, and Gregg Shively of Advanced Energy Experts gave a presentation that covered all agenda items for the committee meeting (attached).

4. Open Discussion

Advanced Energy Experts:
Matt Stolte: I have a question with respect to these technology-type projects. How are we making sure that this is on our menu with respect to the utility master plan and that alignment with the evaluation of technologies, is there a rep from the Climate Action Commitment that needs to be on that committee?
Mary-Ann Ibeziako: I'm anticipating when we reach out to the academic folks, they can probably point us to the right folks that we need to vet as part of the utility master plan, we will look at new and cutting technology, at least to a pilot level that will be factored in. So, when you do reach out to the academic folks, they may lead us to the right folks that need to take the lead in those areas. But to answer your question, yes, we will factor in some of those up-and-coming technologies.
Matt: And would the Advanced Energy Experts be the ones that would be the kind of the third party that really knows how and where the industry is moving to oversee what the consultants put together?
Mary-Ann: Yes, they're available to you to utilize as well to review as a third party, to do a market vetting to make sure that we are in line with the market.
Matt: What's the confidential nature of this information then when it says confidential?
Elaine Wilkes: We can actually remove that; this is our standard template. This is the IRAs public summary of all the items in it to save you from reading 400 pages of Senate documentation. So, now we can remove that and I'll send a new copy to Kristina. We would love for this to be a reference guide for this group because the bill is so large and being able to read through it is not the easiest thing. This hopefully will be a good summary for everyone to look back onto.
Jack Leff: I do political economy and not tax stuff, but I'm curious about how we can take advantage of some of these tax-based credits as a public institution. From my understanding, they are typically applied to income

tax and while we pay payroll and ubit, We don't pay income tax, I believe. So, I'm just sort of curious about how we can take advantage of these credits? What does that look like in practice?
Gregg Shively: There's something in the code that the government will issue a payment in lieu of a tax. It's not clear exactly how that's going to work out.
Bernie Schaffler: I think what Gregg is saying is the investment credit could actually be a payout to you. I think there's a cash option payout to you. To Gregg's point, I think there are a lot of things that are still being worked out.
Gregg: Largely, in the past, at least where that hasn't been the case, you've had to leverage third-party tax equity. So, they may need to own a project for say five years to get that tax value out of it. Solar projects on the rooftops are structured that way. Third-party can monetize the ITC and then you take the asset after that period.
Elaine: And there's a benefit that comes to the university, like we saw with the solar projects that Gregg is referencing. There's more clarity to come with this just now being official, with a tremendous amount of money and a wide variety of projects which we're going to go into a bit more with some of the subsequent slides. But exactly how it's going to be administered and who's going to do the administration and how it all will be applied and then how you would apply for it: we expect to have that clarity in 2023. But unfortunately, at the moment, they haven't identified all of those arenas. So, we're going off of prior experience of how this is potentially going to work until it's been officially determined.
Bernie on tax credit slides: It's important to note that you can't take both the production tax credit and the investment tax credit. You need to take one or the other.
Jack: I'm curious if that also applies to taking advantage of other sorts of funding sources. I'm noticing that in particular for brownfield sites, a lot of those are mine reclamation projects that can get funded through the Mine Reclamation Act of 1979, which provides capital funding rather than breaks from energy production. I'm wondering if that's fair game to pair. Can I apply for that grant for capital expenditures and then also apply for the new clean electricity production tax credit for the energy generated from the reclaimed site and get both benefits?
Bernie: I'd like to say yes, but it's not clear.
Gregg: I'm pretty sure it's yes because they think reclaiming that way you're not committing to what you're going to do with it once it's reclaimed. So, you can get that incentive and clean up reclaimed land and then decide to supplement, decide to put solar on it and then something to cover that capital. It is specific to the capital, the solar, so it wouldn't apply back to any capital required to reclaim.
Jack: I guess the more complicated question would become, what about something like a project built in, let's say low-income rural areas that have provisions from both the infrastructure bill and the IRA. Are those mutually exclusive? Because they both deal with energy and they both deal with the same communities, but it's a different funding mechanism.
Gregg: I'm not clear on what the first one, the infrastructure bill, has but it wouldn't be able to double-dip on the energy expenses or the energy capital or the energy revenues or anything tied to that. But, sometimes, for example, if a roof needs replaced to put solar on it, there's a lot of debate as to whether or not that roof cost should be included in the solar asset or under the Infrastructure Bill.
Mary-Ann: With the extension or the new tax credit, can we still qualify the cost for the interconnect for the current solar that we're putting in?
Bernie: Yes, I believe so.
Elaine: Projects that are smaller than five megawatts can include the interconnect.
Mary-Ann: So, they can go backward and calculate and build that into their model?
Gregg: I'm guessing they already had it in the model. This almost reads as if it's excluding the interconnection costs now going forward, which we'd need to understand better and see in action. Because, here too, for even large projects, interconnection costs were part of the project costs that were used to calculate the ITC, but 30%, as well as development costs, you know, anything that was in a project performa to make it live.
Mary-Ann: So, this is pretty much saying for anything over five, interconnection will no longer be allowed?
Gregg: It's not clear but it seems to be insinuating that.
Matt: For the Advanced Energy Project credit and they talk about energy efficiency: does that align with net-zero capital projects? Is there any incentive there?
Elaine: It may. You have the waste reduction and the energy efficiency and recycling. So, it would suggest that, yes. But again, exactly what is going to qualify and what is not...we probably have to look more deeply into it at the time when we would go to apply to make sure.
Mary-Ann: I was going to add for the team that one of the things that we are working with Advance Energy Experts on is to look at the different buckets and then see how we can as much as possible align them with the different subcommittees that are working, as a resource to them to really position VT so that we can at least take

advantage of a lot of these grants and programs. Working with our folks over on the academic side to see what kinds of programs, what kinds of research, especially when it comes to talks about policies and things that need to be created for the EPA and things to enable some of these projects, what needs to get done. So, this will be an ongoing partnership. This is just really high level today. We are going to make sure that the subcommittees take the lead within their respective areas pertaining to their buckets for the grant.

New name and reporting structure:
Kristina Cook: Governance has gone through a complete overhaul, if you have questions, just let me know and I can reach out to governance if I don't have the answer.

New and returning committee members:
Kristina Cook: I know that sometimes it can be confusing, trying to figure out who's a member and who's not a member. If you're ever in doubt about whether or not you are a member, feel free to reach out. We have six more appointments that will be coming soon.

Other:
Jack Leff: Given the focus on hydrogen, I'd like to see future presentations focus more on incentives for solar and wind as well as where the money is located and how we can access it for our purposes.
Todd Schenk: I wasn't quite sure what the point of that was, to be honest, and I just would be helpful at some point to have a sense of what are these consultants doing? And particularly for those of us around the committee. I think it's sophisticated space. There's a lot going on in terms of things we may be able to take advantage of and I totally understand why a consultant will be brought in to do that. But in terms of what we should do with the information as a committee as opposed to what happens on the energy management side within CPIF. And I'm not doubting that is valuable to do, but I think it would be helpful. I'm sure today isn't the appropriate time. We're already long over, but at some point, just to get a sense, if they're going to be brought in on a regular basis, what is it we should be taking away from it? What is it that we should be reflecting on or other things we should be doing after these talks other than just sort of FYI for us.
Mary-Ann Ibeziako to Todd: They are the risk manager for the university. And primarily they were brought in because one of our goals for the whole committee was to look at goal 14, innovative funding and financing, that's available out there to help us to achieve some of these goals. And I think the primary focus today was to just more of an FYI to say here are these two bills that were just recently passed. And here are different buckets within those bills that are applicable to some of the goals that you're striving to meet. And I think what we're doing right now is really looking at the different buckets that align with our goals and making sure that hopefully, we can work with the different subcommittees that are responsible for some of those goals to ensure that the university is well-positioned to go out to request some of those grants. And I think Jack's question about the methodology, we are working with them on that. Yes, the federal government assigns those funds to respect their state agencies. And the university right now with the different buckets that are available, we're putting together teams. We're not there yet, and that's what we're going to reach out to this group to say who wants to be involved in those buckets that will aggressively pursue some of the funds that are available. To answer your question from the academic side, some of these grants or bills, they're open-ended. They are probably going to look to some of us, as people who are the experts to craft what should the requests, methodology, or the form look like. And that's what they're going to rely on, the expertise. So, at a high level, the whole intent was to address goal 14, which is what innovative or other funding mechanisms are out there. And then given our goals, how can we align ourselves to make sure that we can reach out to take advantage of some of these funds as they become available.

5. Adjournment

A motion was made and seconded to extend the meeting by 15 minutes. The motion carried.

There being no further business, a motion was made and seconded to adjourn the meeting at 3:15pm.

Energy & Sustainability Committee

September 26th, 2022 – 2:00pm

Agenda

- Welcome and Opening Remarks
- Approval of Proposed Agenda (if a quorum is present)
- New Business
  - New Name and New Reporting Structure
  - Welcome New and Returning Committee Members
  - Charge, Ground Rules, and Agenda/Guest Speaker Input
  - 2022 VT Climate Action, Sustainability, and Energy Progress Update
  - Green RFP Update
  - Guest Speakers: Advanced Energy Experts
- Open Discussion

New Name and Reporting Structure

- We are now officially the Climate Action, Sustainability, and Energy Committee
    - You may still see our old name “Energy and Sustainability Committee” on the Governance Office website and the SharePoint until updates are completed by the Governance Office.
- The Commission on University Support has been dissolved. We now report directly to the newly formed University Council Cabinet who will then share our business with the University Council.

Welcome New and Returning Committee Members!

New Members		Returning Members
Jeri Baker	Katie Smith	Mary-Ann Ibeziako (Chair)
Zhou Fu	Madison Betts	Chris Kiwus
Wesley Gwaltney	Gia Ha	Ken Miller
Gwyneth Martin		Liza Morris
Annie Hassel Lawrence		Blake Bensman
Pat Donovan		Rob Lowe
Nathaniel Humphreys		Dana Hawley
Dean Paul Winistorfer		Todd Schenk
Rachel Maizel		
Lilian Prins		
Princess Merritt		
Claudia Budzyn		
Amy Hogan		
Kas Church		
Scott Nachlis		

6 more appointments coming soon!

Charge

To provide guidance to the university administration on the implementation of the university's Climate Action Commitment and opportunities to enhance Virginia Tech's pursuit of environmental quality and social sustainability. The committee makes recommendations regarding the application of policies, infrastructural and operational changes, educational strategies and modifications, and other steps intended to foster broad engagement with the university's environmental goals. The committee oversees subcommittees that each carry out aspects of the committee's charge.

Reports to: University Council Cabinet.

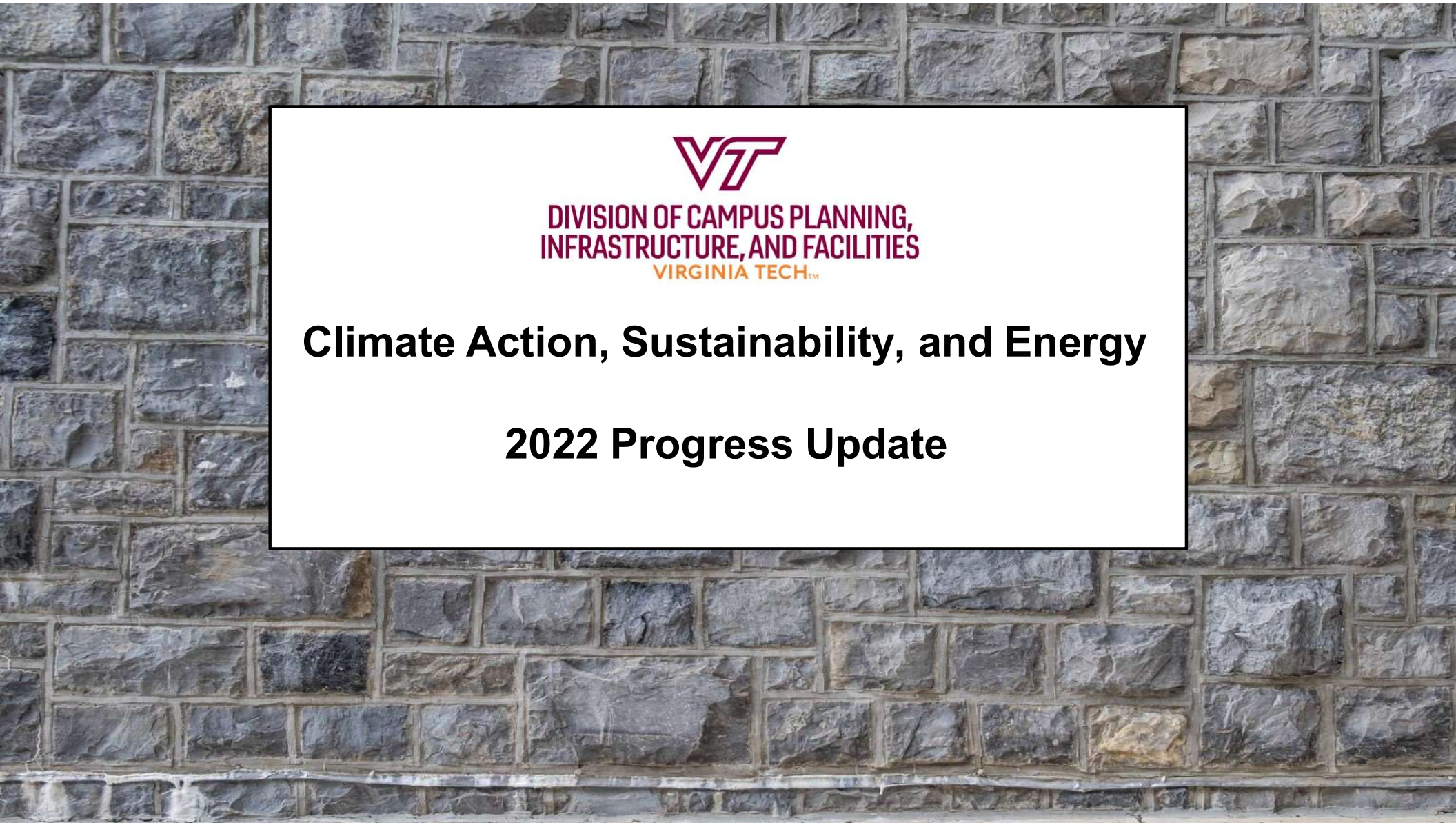
Governance Protocols

- Please assign a proxy for meetings you cannot attend (notify Kristina Cook of your expected absence ahead of time).
- Please do not vote on items if you are not a member.
- We follow Robert's Rules of Order during meetings.

We Would Like Your Input!

- Agenda ideas
- Guest speaker suggestions
- Colleagues to add to meeting invites and subcommittees (list of current subcommittees in box to the right for reference)

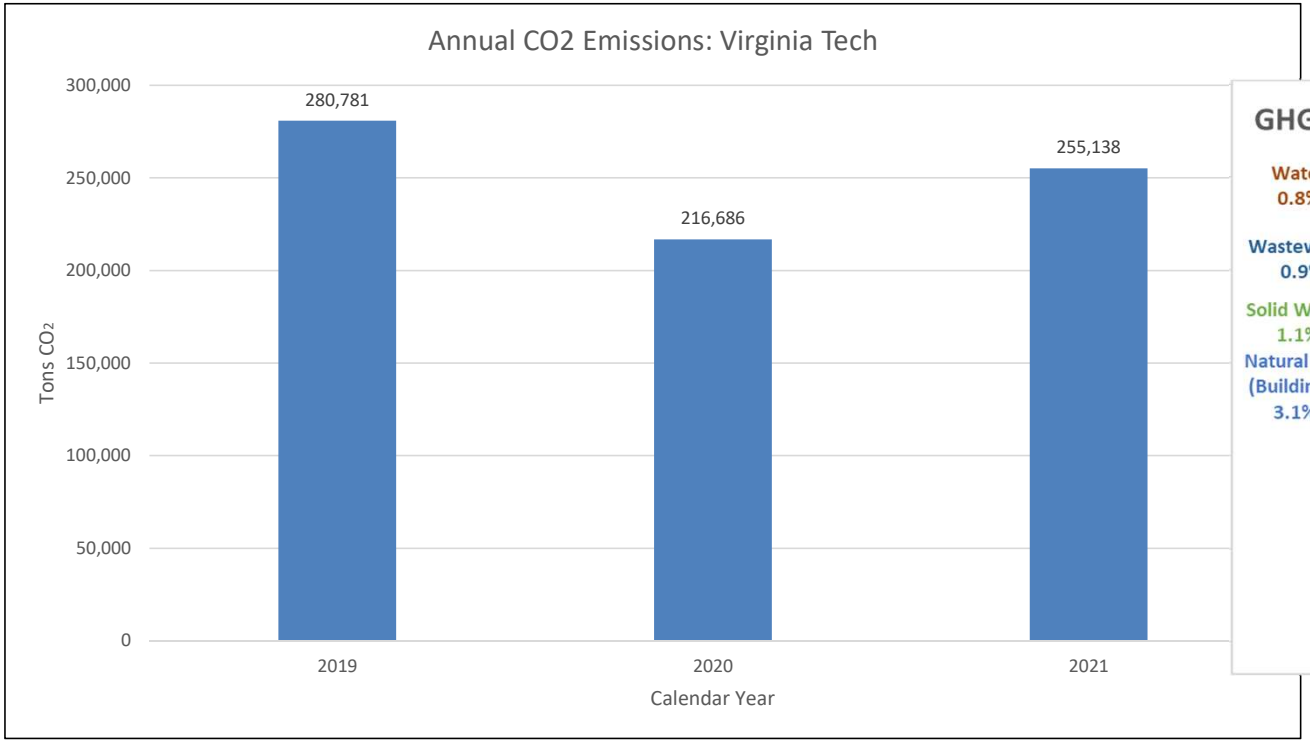
- **GHG Inventory**
- **Climate & Sustainability Education and Research (CSER)**
- **Climate Justice**
- **Sustainable Campus Culture, Engagement, & Sustainable Choices**
- **VT-Blacksburg Sustainability Collaboration**
- **Sustainable Procurement**
- **Carbon Offset & Management**
- **Carbon-Neutral Commuting & Carbon-Neutral Fleet**
- **Equitable Housing**

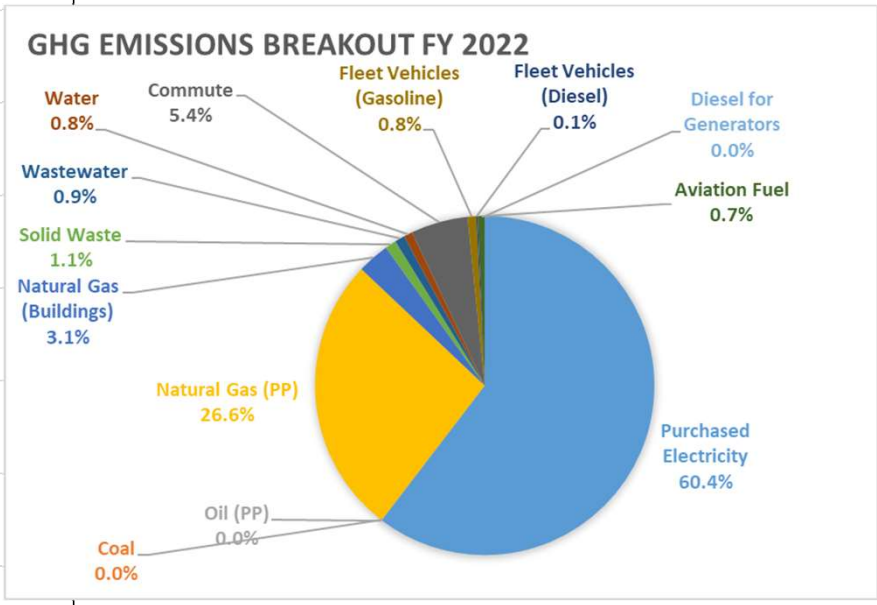


Climate Action, Sustainability, and Energy

2022 Progress Update

Annual CO_2 Emissions





CY2021 shows a ~9 percent decrease in total emissions compared to CY2019.

Develop innovative financing mechanisms to achieve Climate Action Commitment goals

- 123 approved Green RFPs at over $1.75 million
- CPIF Sustainability Foundation fund established
  - Giving Day participation
  - Bee Campus USA certification chosen as Honors College crowdfunding campaign program of choice
- Solar Power Purchase Agreement
- $6 million Energy Action Plan 6

Achieve a Zero Waste Campus by 2030

- Hired Campus Waste and Recycling Manager
- Student Green RFP approved to pilot reusable bags as replacements for single use plastic bags at dining centers
- $50,000 approved for Waste Management Consultative Services – Contract signed to work with Reduction in Motion
- 14+ tons of material recycled at home football games
- Calendar Year 2021 Recycling Rate = 31.5%
- Calendar Year 2021 Waste Diversion Rate = 78%

Reduce Building Energy Consumption

- Campus wide lighting audit complete; campus wide LED conversion underway
- Ramping up HVAC retro-commissioning and BAS modernization
- Chilled water plant and distribution system upgrades and optimization
- LEED O+M Recertification Program – measurement for high performance buildings
- Lights Out/Power Down program exceeds reduction goals for the 13th year in a row

2020 Climate Action Goals and Progress: Engagement

- Gaining broad institutional support through CAC Road Show series
  - Presented CAC and key connections to more than 15 major campus groups
- Using Climate Action, Sustainability, and Energy (CASE) Committee task forces to move program and policies forward that support CAC implementation
  - Revising and expanding membership to include members of frontline communities
- Student engagement through OS programs and events
- Building out a Climate Action Living Lab network


GO LONG
LIVE GREEN
SAME DAY GREEN TEAM


INFORMATION DESK


BE AWARE, BE PREDICTABLE, BE A HOKIE.

2022-2023 Green RFP – Key Points and CASEC's Role

- Formal university program for **student or student organizations** to submit sustainability projects that support the 2020 Climate Action Commitment
- Program was launched in **academic year 2010-11**
- The uniqueness – proposals are submitted, reviewed, **select proposals prioritized**, approved proposals funded, & implementation initiated within a year of receiving them
- **CASEC to review & prioritize the select proposals**

- Encourage your students to work with our office and submit a proposal!

- Detailed information and link to the proposal document: https://www.facilities.vt.edu/sustainability/sustainability-programs/green-rfp-program.html

2022-2023 Green RFP Process and Timeline

DATE	ACTIVITY
Sep 11	Green RFP 2022-23 announcement
Nov 11	Proposal deadline to CASE office
Dec 1	CASE office coordinates review with subject matter experts
Jan 31	**CASEC Subcommittee to review & prioritize proposals**
Feb 27	Subcommittee presents recommendations to CASEC for approval
Mar 6	CASEC presents proposals to the Office of Budget & Financial Planning
Mar/Apr	OBFP convenes Budget Review Committee- identifies funding sources
July	Select proposals approved - implementation initiated

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Open Discussion

- New name and Reporting Structure
- New and Returning committee members
- Charge, ground rules, and agenda/guest speaker input
- 2022 VT Climate Action, Sustainability, and Energy Progress Update
- Green RFP Update

Next Meeting: October 24, 2022

Inflation Reduction Act

2022

Introduction Overview

- The Inflation Reduction Act (“IRA”) changes the incentive expiration dates from Jan 2022 to Jan 2025 for existing incentives.
- Changes the existing incentives to a base plus bonus structure.
- Adds a number of new incentives in the form of tax credits and grants for additional technologies.
- The legislation has approximately $369 billion of climate and clean energy provisions including incentives for renewable energy, energy storage, carbon capture and carbon sequestration, hydrogen, nuclear power, biofuels and electric vehicles

Potential Qualifying Project Types

Type of Project	Potential Applicable Credit / Grant per the IRA of 2022
Installation of an Electric Generating Facility/Combined Heat and Power Projects	Clean Electricity Production Credits (“CEPC”) or Clean Energy Investment Credits (“CEIC”)
Installation of Solar	CEIC or CEPC credits
Installation of Wind	CEIC or CEPC credits
Production of BioFuels/BioGas	Greenhouse Gas Reduction Fund and/or CEIC or CEPC Credit & Production of BioFuels Grant
Energy Storage Projects	CEIC or CEPC Credits
Green Hydrogen Standard	Tax credit for “qualified clean hydrogen” which would pay producers up to $3 per kilogram of hydrogen from 2023 depending on the levels of lifecycle emissions and staff wages.
Electric Vehicles	Tax credits for new, used and commercial vehicles acquisitions
Carbon Capture and Storage	Section 45Q tax credits for projects beginning construction prior to 2033
Climate-Smart Agricultural Practices	$20.0 Billion Grant
Support of Fire Resilient Forests, forest conservation and Urban Tree Planting Programs	$5.0 Billion Grant
Conservation and Restoration of Coastal Habitats	$2.6 Billion Grant
Consumption of Switchgrass, wood waste via Pyrolysis	Greenhouse Gas Reduction Fund and/or CEIC or CEPC Credit & Production of BioFuels Grant

Clean Energy Production Tax Credits

New Clean Hydrogen Production Tax Credit (45V)

- Creates a new 10-year incentive for clean hydrogen production with four tiers and a maximum of 4 kilograms of CO2 equivalent (CO2e) per kilogram of hydrogen (H2).
- Projects must begin construction by 2033. Eligibility includes retrofit facilities.

New Advanced Manufacturing Production Tax Credit (45X)

- Creates a tax credit for the production of clean energy technology components that are produced in the United States or by a U.S. possession. Eligible components include solar components, wind turbine and offshore wind components, inverters, many battery components, and the critical minerals needed to produce these components.
- Begins to phase out in 2029 and phases out completely in 2032.

Nuclear Power Production Tax Credit (45U)

- Provides a nuclear power production credit of 1.5 cents multiplied by kilowatt hours (kWh) of electricity produced minus 16% of the facility's gross recipients in excess of 2.5 cents per kWh.
- Becomes available to facilities already in service in 2024 and ends after 2032.

Extension of Renewable Electricity Production Tax Credit (Section 45)

- Extends the existing production tax credit for applicable renewable energy sources. This tech-specific PTC ends in 2024 and is replaced by the new tech-neutral Clean Electricity PTC (45Y) which begins in 2025.
- Revives the PTC for solar facilities which ended in 2006 and extends to 2024.
- Extends the date of construction for geothermal, wind, closed- and open-loop biomass, landfill gas, municipal solid waste, hydropower, and marine and hydrokinetic facilities to 2024.
- Maintains a credit amount of 1.5 cents per kWh.
    - Applies a 10% bonus for meeting domestic manufacturing requirements for steel, iron, or manufactured components.
    - Applies a 10% bonus for facilities located in energy communities (defined as brownfield sites or fossil fuel communities).
- Increases hydropower, municipal solid waste, and marine and hydrokinetic credit to full value (was previously halved).
- Strikes the offshore wind credit phaseout for facilities placed into service before 2022.

New Clean Electricity Production Tax Credit (45Y)

- This tech-neutral PTC replaces the above Renewable Electricity Production Tax Credit once it phases out at the end of 2024 and is an emissions-based incentive.
- Taxpayers choose between a PTC (45Y) and an ITC (48E).
- Creates a PTC credit of 1.5 cents per kWh of electricity produced and sold or stored at facilities placed into service after 2024 with zero or negative GHG emissions.
    - Applies a 10% bonus for projects located in energy communities (defined as brownfield sites or fossil fuel communities).
    - Applies a 10% bonus for meeting domestic manufacturing requirements for steel, iron, or manufactured components.
    - Applies a 10% bonus for projects located in low-income communities or on Tribal land; 20% bonus for projects located in low-income residential buildings or part of low-income economic benefit projects.
- Facilities may use carbon capture, utilization, and storage (CCUS) to reach qualifying emissions levels.
- Credits are set to phase out the later of 2032 or when emission targets are achieved (i.e., the electric power sector emits 75% less carbon than 2022 levels). Facilities will be able to claim a credit at 100% value in the first year, then 75%, then 50%, and then 0%.

Source: Bipartisan Policy Center

Clean Energy Investment Tax Credits

Extension of Energy Investment Tax Credit (Section 48)

- Extends the existing energy ITC for applicable energy projects and ends in 2024 for most technologies and is replaced by the new tech-neutral Clean Electricity ITC (48E), which begins in 2025.
- Extends date of construction in most cases to 2024 and maintains a 10% or 30% credit.
- Maintains 30% credit for solar energy property, geothermal property, fiber-optic solar property, fuel cell property, microturbine property, small wind property, offshore wind property, combined heat and power property, and waste energy recovery property constructed before January 1, 2025.
- Creates 30% credit for energy storage technology 3,4 biogas property, microgrid controllers, dynamic glass, and linear generators constructed before January 1, 2025.
- Extends 10% credit for microturbine projects constructed before January 1, 2025.
- 30% credit for geothermal heat pump projects constructed before January 1, 2033. Credit reduces to 26% in 2033 and 22% in 2034.
    - Applies a 10% bonus for meeting domestic manufacturing requirements for steel, iron, or manufactured components.
    - Applies a 10% bonus for projects located in energy communities (defined as brownfield sites or fossil fuel communities).

New Clean Electricity Investment Tax Credit (48E)

- Replaces the above Energy ITC once it phases out at the end of 2024. 48E is an emissions-based incentive that is neutral and flexible between clean electricity technologies. Taxpayers choose between a PTC (45Y) and an ITC (48E).
- Creates an ITC credit of 30% of the investment in the year the facility is placed in service.
    - Applies a 10% bonus for projects located in energy communities (defined as brownfield sites or fossil fuel communities).
    - Applies a 10% bonus for meeting domestic manufacturing requirements for steel, iron, or manufactured components.
    - Applies a 10% bonus for projects located in low-income communities or on Tribal land; 20% bonus for projects located in low-income residential buildings or part of low-income economic benefit projects.
- Clean electricity projects smaller than 5 MW can include the costs of interconnection under the ITC.
- The Treasury Department is directed to publish emission rates for similar technologies each year for taxpayers to use for purposes of determining their eligibility.
- Credits are set to phase out the later of 2032 or when emission targets are achieved (i.e., the electric power sector emits 75% less carbon than 2022 levels). Facilities will be able to claim a credit at 100% value in the first year, then 75%, then 50%, and then 0%.

Advanced Energy Project Credit (48C)

- Extends the 30% investment tax credit to clean energy projects to strengthen domestic energy manufacturing and support the production and recycling of clean energy products. It also expands credit to include projects at manufacturing facilities that want to reduce their GHG emissions by at least 20%.
- Tax credit is funded at $10 billion for eligible projects.
- Can be applied to low-carbon industrial heat, carbon capture, transport, utilization and storage systems, and equipment for recycling, waste reduction, and energy efficiency.

Source: Bipartisan Policy Center

Fuel & Clean Vehicle Tax Credits

Fuel Tax Credits

New Clean Fuel Production Credit (45Z)
- Creates a new technology neutral 2-year tax credit for low-carbon transportation fuel.
- Maximum credit is $1 per gallon (or $1.75 per gallon for sustainable aviation fuel) multiplied by an emissions factor.
- Emission factor is calculated proportional to a maximum emission rate standard of 50 kilograms of CO_2e per 1 million British thermal units (mmBTU).
- Emission rate is calculated with GREET model. (Greenhouse gas Regulated Emissions and Energy in Transportation)

New Sustainable Aviation Fuel (SAF) Credit (40B)
- Creates an incentive to lower aviation transportation emissions.
- Credit starts at $1.25 per gallon for aviation fuel that reduces GHG emissions by 50% and increases by one cent for each additional percent reduction, maxing at $1.75 per gallon.
- Credit is authorized through 2026.

Extension of Second Generation Biofuel Incentives
- Extends existing second generation biofuel incentives through 2024.

Extension of Biodiesel and Renewable Diesel Credit 8,9
- Extends the current credit of $1 per gallon through 2024.

Clean Vehicle Tax Credit

Clean Vehicle Credit (30D)
- Maintains the existing $7,500 consumer credit for the purchase of a qualified new clean vehicle, including electric vehicles, plug-in hybrids, and hydrogen fuel cell vehicles.
  - Credit is reduced or eliminated if a certain percentage of the critical minerals utilized in battery components are not extracted or processed in the U.S. or a Free Trade Agreement country or recycled in North America.
  - Credit is reduced or eliminated if EV is not assembled in North America or if the majority of battery components are sourced outside of North America.
- Implements a maximum of $80,000 per vehicle for vans, SUVs and pickups and $55,000 for other vehicles.
- Implements an income eligibility limit of $150,000 or $300,000 for joint filers.
- Eliminates the previous manufacturer quota, which phased out the tax credit for manufacturers as they neared 200,000 clean vehicles sold.

New Previously Owned Clean Vehicle Credit (25E)
  - Creates a consumer tax credit for the purchase of previously owned clean non-commercial vehicles, including electric vehicles and plug-in hybrids. Credit is equal to the lesser of $4,000 or 30% of the vehicle cost.
  - Sets a maximum sale price of $25,000. Model must be at least 2 years older than the year of sale.
  - Implements an income eligibility limit of $75,000 or $150,000 for joint filers.
- **New Commercial Clean Vehicle Credit (45W)**
  - For class 1-3 (under 14,000 lbs.) vehicles for commercial use, creates a $7,500 tax credit tax for the purchase of electric vehicles or other qualified clean vehicles.
  - For class 4 and above (over 14,000 lbs.) vehicles for commercial use, increases the credit to $40,000.
- **Extension of Alternative Fuel Refueling Property Credit (30C)**[12]
  - Extends tax credit for alternative fuel refueling property credit to property placed into service before 2033.
  - Increases the tax credit to 30% of the cost of alternative fuel refueling property up to $100,000.

Source: Bipartisan Policy Center

Carbon Management

Carbon Capture and Sequestration Tax Credit (45Q)

- Enhances the tax credit for carbon capture and direct air capture (DAC).
- Extends the deadline for construction to January 1, 2033 and increases the credit amount:
  - From $50 to $85 per ton for CCUS for industrial facilities and power plants for saline geologic formations.
  - From $35 to $60 per ton for utilization of captured CO2 and its precursor carbon monoxide to produce low and zero-carbon fuels, chemicals, building materials and other products, or for enhanced oil recovery (EOR).
- From $50 to $180 per ton for DAC stored in saline geologic formations and from $35 to $130 per ton for utilization or EOR.
- Decreases minimum plant size eligibility threshold:
  - From 100,000 to 1,000 tons per year for DAC.
  - From 500,000 to 18,750 metric tons per taxable year for Electric Generating Facility paired with design capacity requirement below.
  - From 25,000 to 12,500 metric tons per taxable year for any other facility.
- Design Capacity Requirement: Point-source carbon capture projects on electric generating units will be required to design capture equipment to capture at least 75% of unit (not facility) CO2 production, subject to a review if facility emissions increase in future years.
- Direct Pay Compromise: Projects will receive direct pay for the first 5 years after the carbon capture equipment is placed in service Nonprofit organizations and co-ops can receive direct pay for all 12 years of the credit.

Investment in Low-Carbon Materials & Buildings

- Supports low-carbon materials procurement for federal projects, along with multiple efforts to standardize environmental impact disclosure, labeling and verification of low-carbon concrete and construction materials
- EPA to support the development of standardized, high-quality, transparent environmental product declaration of greenhouse gas emission associated with construction materials.
- $100 million for EPA to identify and label low-carbon construction materials used for federal buildings and federal transportation projects
- Procurement of low-carbon materials in federal projects:
  - New authority granted to the Federal Emergency Management Agency (FEMA) to cover costs associated with low-carbon materials or to encourage low-carbon and net-zero energy projects when administering disaster relief.
  - $2 billion for FHA to reimburse or provide a 2% incentive in federal transportation projects for the use of low-carbon construction materials that cost the same or incrementally more than traditional construction materials.
  - $2.15 billion to the Federal Buildings Fund for GSA to acquire and install low-carbon building materials and products.

Biomass, Carbon Removal, and Forest Management

- $50 million in competitive grants from the U.S. Forest Service to states and eligible entities to pay forest landowners for practices that increase carbon removal on private lands.
- $100 million for the U.S. Forest Service Wood Innovation Grant Program to support solutions that utilize forestry residue for innovative end uses.
- New Clean Electricity Production Credit (45Y) includes net-negative emission electricity production using solutions like Biomass Energy with Carbon Capture and Storage (BECCS). Net emission for facilities which use combustion and gasification technologies (used to breakdown biomass) is accounted for through cradle-to-gate life cycle assessment.

Source: Bipartisan Policy Center

Community Investment and Energy Justice

Environmental and Climate Justice Block Grants

- $2.8 billion to the EPA for grants and $200 million for technical assistance.
- 3-year grants are available for projects related to climate change and air pollution, including air pollution monitoring, extreme heat risk mitigation, resiliency and adaptation, indoor pollution reduction, and community engagement.
- Tribes, local governments, and universities in partnership with community-based non-governmental organizations (NGOs) are eligible, as well as individual or groups of community-based NGOs.

Neighborhood Access and Equity Grants

- $3 billion, with $1.1 billion set aside for disadvantaged communities, to the FHA for grants to improve transportation access and mitigate negative safety or environmental impacts in underserved communities.
- Grants may be used for improvements to reduce air pollution and GHG emissions, manage stormwater run-off, address urban heat islands, and to monitor air quality, transportation related GHG emissions and pollution, and gaps in tree canopy coverage.
- State, local, territory, and Tribal government entities are eligible.
- Federal cost share of a project in a disadvantaged or underserved community may be up to 100%.

Grants to Reduce Air Pollution at Ports

- $3 billion to the EPA to award rebates and grants to port authorities, state, regional, local, or Tribal agencies, air pollution control agencies, or private entities for the purchase or installation of zero-emission port equipment, for associated planning, and to develop climate action plans.
- $750 million set aside for ports located in nonattainment areas (areas with high air pollution).

Clean Heavy-Duty Vehicles

- $1 billion, with $400 million set aside for communities located in nonattainment areas, for grants and rebates for up to 100% of costs for clean heavy-duty vehicles (e.g., school buses and garbage trucks) as well as associated maintenance, workforce training, and planning.
- States, municipalities, Tribes, and nonprofit school transportation associations are eligible.

Source: Bipartisan Policy Center

Community Investment and Energy Justice

Low Emissions Electricity Program

- $68 million in total to the EPA, including $17 million for education, $17 million for technical assistance, and $17 million for partnerships within low-income and disadvantaged communities related to GHG emissions reductions.
- An additional $18 million appropriated to carry out activities of the program and ensure GHG emissions reductions are achieved from domestic electricity generation and use.

Energy Credit for Solar and Wind in Low-Income Communities

- Creates a 40% investment tax credit for solar or wind projects located in a low-income community or on Tribal land and 20% for facilities part of low-income residential housing or low-income economic benefit projects.

USDA Assistance for Rural Electric Cooperatives

- $9.7 billion to the Department of Agriculture (USDA) until 2031 for financial assistance (including loans) to improve resiliency, reliability, and affordability of rural electric systems, including:
  - Purchase of renewable energy and renewable energy systems, zero-emission systems, or carbon capture and storage systems;
  - Deployment of these systems;
  - Improvements to electric generation and transmission systems.
- Maximum award is $970 million and must not exceed 25% of the total project cost.

Rural Energy for America Program (REAP)

- Provides financial assistance for adoption of clean energy technologies in rural communities.
- $2 billion for the USDA REAP program until 2031 to provide competitive grants and loan guarantees to farmers, ranchers, and rural small businesses for renewable energy systems or energy efficiency improvements.
- More than $300 million is set aside to provide grants and loans to provide financial & technical assistance for “underutilized renewable energy technologies” that are not as widely adopted.
- Federal cost share for grants is raised from 25% to a maximum of 50%.

Source: Bipartisan Policy Center

Clean Energy Financing

DOE Loan Programs Office (LPO)

- Over $40 billion in available loan and loan guarantee authority under its three programs:
    1. $40 billion in new Title 17 loan authority available through 2026 with $3.6 billion for credit subsidies.
    2. $3 billion for AVTM credit subsidies and eliminates $25 billion loan authority cap.
    3. $75 million for TELGP loan authority through 2028 for direct loans and loan guarantees and increases loan authority cap from $2 billion to $20 billion.
- The Energy Infrastructure Reinvestment Financing provision provides LPO with new authorities to make loan guarantees, including refinancing, for projects that:
    - Retool, repower, repurpose, or replace energy infrastructure that has ceased operation (including environmental remediation and carbon management on fossil fuel projects), or
    - Enable operating energy infrastructure to avoid, reduce, utilize, or sequester greenhouse gas emissions.
    - Provides $5 billion to carry out program authorities and $250 billion in loan authority through 2026.

Greenhouse Gas Reduction Fund

- Provides EPA funding for grants to state, local, regional, and Tribal programs that provide financial support to low and zero carbon technologies and can act as seed capital for regional, local, state, or Tribal green banks
- Eligible programs must prioritize projects that would not otherwise have access to financing and any repayments derived from grants must be recycled into the program for additional grants or operation.
- The program also provides grants to entities that would then in turn provide funding or technical assistance to establish a financial program as described above.
    - Provides $11.97 billion through 2024 to make grants for eligible financial entities or entities that would in turn provide financial or technical support to establish such financial entities.
    - Provides $15 billion through 2024 to make grants for eligible entities to provide financial and technical support and support the deployment of clean energy technologies in low-income and disadvantaged communities.
    - Provides $30 million for administrative costs of the program through 2031.

Domestic Manufacturing Conversion Grants

- $2 billion through 2031 for grants to retool existing auto manufacturing facilities to promote for domestic production of clean vehicles, including hybrids, plug-in hybrids, EVs, and hydrogen fuel cell vehicles.

Enhanced Use of Defense Production Act

- $500 million to carry out the Defense Production Act of 1950 for critical mineral processing and heat pumps – available until Sept 30, 2024.

Biofuel Infrastructure

- $10 million to EPA for new grants to support advanced biofuel (excluding corn-starch ethanol) industries that provide 50% GHG emission reduction compared to conventional fuels.
- $500 million until 2031 for competitive grants with up to 75% cost share to support infrastructure improvements for blending, storing, supplying, or distributing biofuels with higher levels of ethanol and biodiesel.

Source: Bipartisan Policy Center

Agriculture Programs

Environmental Quality Incentives Program (EQIP)

- $8.45 billion for grants for practices or enhancements that directly improve soil carbon storage or decreased emissions of nitrous oxide or other GHGs, prioritizing activities that reduce enteric methane emissions.
- This includes financial and technical assistance resources for producers and landowners to plan and install structural, vegetative, and land management practices on eligible lands to alleviate natural resource concerns.

Conservation Stewardship Program (CSP)

- $3.25 billion for financial and technical assistance for producers to maintain and improve existing conservation systems and to adopt additional conservation activities comprehensively across a producer's entire operation.
- Eligible practices or enhancements will directly improve soil carbon storage or decrease emissions of nitrous oxide or other GHGs, allowing for aggregation of activities.

Agricultural Conservation Easement Program (ACEP)

- $1.4 billion is provided for this program which enables financial and technical assistance through agricultural land easements that limit nonagricultural uses on productive farm or grass lands, and wetland reserve easements that protect and restore wetlands.

Regional Conservation Partnership Program (RCPP)

- $4.95 billion provided for financial and technical assistance for state, multistate, or watershed-scale projects, establishing partnership opportunities that optimize federal conservation funding for specific areas and resource concerns.

Conservation Technical Assistance (CTA)

- $1.3 billion for conservation technical assistance provided through the NRCS to ensure broader and more equitable access to the tools and information farmers and ranchers need to carry out climate-smart practices.
    - This program provides conservation planning and implementation assistance through field staff in nearly every county in the United States and its territories.
    - $300 million allocated for NRCS to cooperate with technical service providers and other partners to collect field-based data. This information will be used to evaluate the carbon sequestration and GHG emissions reduction results of the practices supported by CTA.

Source: Bipartisan Policy Center

Other Industries

Offshore Wind and Oil & Gas Systems

- **Offshore Wind**
  - Requires an oil and gas lease sale of 60 million acres in the prior year for offshore wind lease issuance, for the next 10 years.
  - Makes $100 million available for the planning, modeling, analysis, and development of interregional transmission and optimized integration of energy generated from offshore wind.
  - Lifts the offshore wind moratorium in the southeastern U.S. and Eastern Gulf and allows leasing in the U.S. territories.
  - Coastal states must use funding for specified purposes such as coastal restoration, conservation or to finance resilient infrastructure.
- **Oil & Gas**
  - Increases offshore oil & gas royalty rates to a minimum of 16.66% from 12.5% for the next 10 years after the enactment of this bill.
  - Increases onshore oil & gas leasing minimum bid from $2 to $10 per acre for the next 10 years after the enactment of this bill.
  - Increases annual rental rates for new onshore oil & gas leases.
  - Coastal states must use funding for specified purposes such as coastal restoration, conservation, or to finance resilient infrastructure.
- **Methane Emissions Reduction Program**
  - $1.55 billion for EPA to provide incentives, grants, contracts, loans, and rebates for facilities, well operators, and communities to enable methane emission reduction activities like monitoring, reporting, source plugging, obtain technical and financial assistance, install innovative solutions, mitigate negative health impacts, and perform environmental restoration.
  - Establishes a maximum annual methane waste emission rate of 25,000 metric tons of CO2e (vented, released, or flared) for a facility and imposes penalty charges starting at $900 per ton in 2024 and increasing to $1,500 per ton by 2026 for facilities emitting more than that.

Investments in the Permitting Process

- **Grants to Facilitate the Siting of Interstate Electricity Transmission Lines**
  - $760 million through 2026 for DOE to provide grants to facilitate and accelerate the siting and permitting of interstate transmission projects.
- **Federal Permitting Improvement Steering Council Environmental Review Improvement Fund**
  - $350 million through 2026 for the Environmental Review Improvement Fund of the Fixing America's Surface Transportation (FAST) Act that seeks to accelerate and streamline the environmental review process.
- **EPA Efficient, Accurate, And Timely Reviews**
  - $40 million through 2026 for EPA to invest in staffing and equipment that provides for more accurate and timely environmental reviews.
- **Environmental Review Implementation Funds**
  - $100 million through 2026 for EPA to develop review documents and a process that provides for a timelier environmental review process.
- **NOAA Efficient and Effective Reviews**
  - $20 million through 2026 for NOAA to invest in staffing and equipment that provides more accurate and timely reviews.
- **Grants To Reduce Air Pollution at Ports**
  - Permitting required for zero emission equipment is also an allowable use of the $2.25 billion in funding through 2027 for EPA to provide grants to purchase and install zero emission equipment at ports.
  - This provision is discussed in the Community Investment and Energy Justice section above.

Source: Bipartisan Policy Center

Other Industries

- **Residential Energy Efficiency**
- **Credit for Residential Clean Energy (25D)**
- **Credit for Energy Efficiency Home Improvements (25C)**
- **Home Energy Performance-Based Whole House Rebates (HOMES)**
- **High-Efficiency Electric Home Rebate Program**
- **Grants for Energy Efficiency Contractor Training**
- **Energy Innovation**
- **Advanced Industrial Facilities Deployment Program**

- **Availability of High-Assay Low-Enriched Uranium (HALEU)**
  - Appropriates $700 million in additional funding to the DOE Advanced Nuclear Fuel Availability program through 2026

- **National Laboratory Infrastructure**
  - Funds infrastructure improvements at the DOE National Laboratories
  - Funding to the DOE Office of Science through 2027 to invest in national lab infrastructure:
    - $133.2 million for laboratory infrastructure projects.
    - $321.6 million for laboratory facilities.
    - $800.7 million for laboratory construction and equipment.
    - $294.5 million for energy sciences projects.
  - $150 million for the Office of Fossil Energy and Carbon Management for infrastructure and general plant projects through 2027.
  - $150 million for the Office of Nuclear Energy for infrastructure and general plant projects through 2027.
  - $150 million for the Office of Energy Efficiency and Renewable Energy for infrastructure and general plant projects through 2027.

- **Forestry Programs**
  - **National Forest System Restoration and Fuels Reduction Projects**
    - $1.8 billion for the National Forest System to support wild-fire risk reducing activities within wildland-urban interface including eligible biomass removal.
    - $350 million for vegetation management, environmental reviews, and inventory of old-growth forests on National Forest System land.
  - **Grants for Non-Federal Forest Landowners**
    - $400 million in competitive grants and cost share from the U.S. Forest Service to support the participation of forest landowners that are underserved or own less than 2,500 acres in forest resilience activities and climate mitigation markets.
  - **State and Private Forestry Conservation Programs**
    - $700 million in competitive grants to states through the Forest Service Forest Legacy Program to conserve environmentally important forest areas that are threatened by conversion to non-forest uses.
    - $1.5 billion in competitive grants through the Urban and Community Forestry Assistance program for tree-planting and related activities in urban areas.

Source: Bipartisan Policy Center

Contact

Bernie Schaffler
Advanced Energy Experts, Inc.
703-989-5009
bschaffler@advancedenergyexpert.com

Elaine Wilks
Advanced Energy Experts, Inc.
703-268-3151
ewilks@advancedenergyexpert.com

Gregg Shively
GreenSky Development Group, LLC
703-584-4184
gshively@greensky-dg.com

Appendix

Definitions

- Environmental Justice Funding
- Apprentice Requirements
- Energy Communities
- Section 45Q
- Green Hydrogen Standard

Definitions

- ***Environmental Justice Funding:*** Clean Energy Tax Credits that include either a bonus or set-aside structure to drive investments and economic development in disadvantaged communities.
- ***Apprentice Requirements***: The apprentice requirements for the CEIC is met if a specified amount of construction or alteration and repair work on the project is performed by qualified apprentices under the National Apprentice Act. This includes work done by contractors and subcontractors.
- ***Energy Communities:*** *D*efined as brownfield sites, areas with significant employment (post-1999) related to extraction, processing, transport, or storage of coal, oil or natural gas, or any census tract (or adjoining tract) that had either a coal mine close after 1999 or coal-fired electric generating unit retire after 2009.
- ***Section 45Q:*** Section 45Q of the US tax code provides a performance-based tax credit for carbon capture projects that can be claimed when an eligible project has securely stored the captured carbon dioxide (CO_2) in geologic formations, such as oil fields and saline formations. The 45Q tax credit is increasing from $50 to $85 per ton of CO_2 sequestered while decreasing the minimum volume of CO_2 that facilities must capture and apply to a qualifying use. While the previous 45Q benefits were only attainable by large-scale facilities, changes outlined in the IRA will help small- and medium-sized projects qualify.
- ***Green Hydrogen Standard:*** has a comprehensive approach to emissions measurement for green hydrogen projects with a maximum of 1 kg CO_2e per kg hydrogen. Certification of green hydrogen projects in accordance with the Green Hydrogen Standard will help enable green hydrogen producers to independently certify their emissions in order to access the tax credits available under the IRA.