Driving Investment in Wind Energy: An Introduction to Incentives and the Inflation Reduction Act

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Photo by Dennis Schroeder. NREL 50697

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Webinar Logistics

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- This webinar will be recorded and posted to the National Renewable Energy Laboratory (NREL) YouTube channel (https://www.youtube.com/watch?v=58EYcYbRKqk&list=PLmIn8Hncs7bHwm27irhqb-iikRurVJ8YF&pp=iAQB) and the U.S. Department of Energy (DOE)'s WINDExchange website (WINDExchange.energy.gov)

- Pose questions using the Q&A function during and at the end of the presentation
    - Questions will be answered either during or after the webinar.

What We Will Cover

- History and impact of major tax credits and incentives
- Introduction to the Inflation Reduction Act (IRA) and its role in the industry
- Q&A.

Photo from Siemens AG, 27847

Speaker Bios

Brian Lips is a Senior Energy Policy Project Manager for the North Carolina Clean Energy Technology Center. He manages the Database of State Incentives for Renewables & Efficiency (DSIRE). In addition to coordinating and overseeing the project's administration and research, Brian also authors DSIRE's content for CA, HI, NC, NV, and SC. Brian joined the Center in 2006 and served in various capacities with the DSIRE project before becoming the manager of the project in 2013. Brian received a degree in Integrated Science and Technology from James Madison University in Harrisonburg, VA, with a focus in Energy and Environmental Science.

Brinn McDowell is a researcher on the Human Dimensions of Wind Energy team at the National Renewable Energy Laboratory, specializing in workforce and economic development for both land-based and offshore wind energy. Her work supports the wind workforce team through workforce assessments and modeling, stakeholder engagement activities, and policy analysis. Brinn holds a master's degree in renewable and sustainable energy from the University of Colorado Boulder and a bachelor's degree in chemistry from the University of Illinois Urbana-Champaign.

History and Impact of Major Tax Credits and Incentives

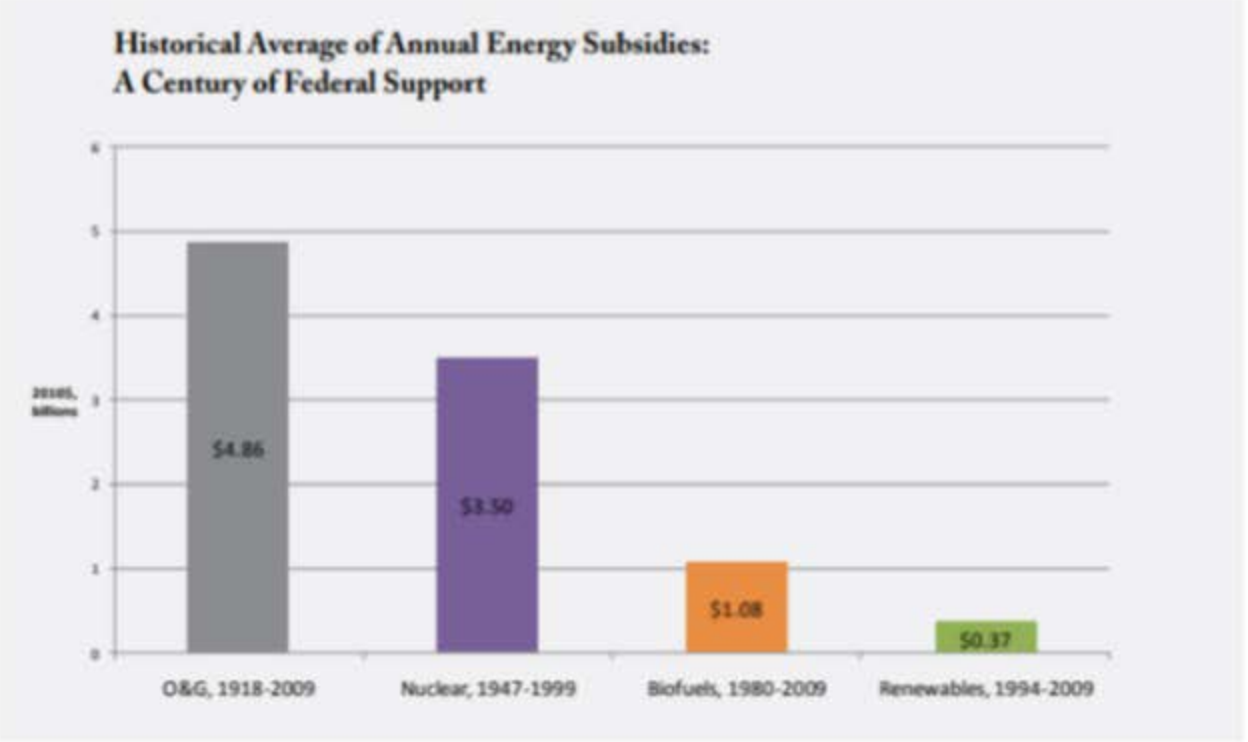
History and Impact of Major Tax Credits

Brian Lips
NC Clean Energy Technology Center

Database of State Incentives for Renewables and Efficiency (DSIRE)

Scan to access DSIRE®

https://www.dsireusa.org



Pfund, Nancy, Healey, Ben. *What Would Jefferson Do? The Historical Role of Federal Subsidies in Shaping America's Energy Future.* https://www.dbl.vc/wp-content/uploads/2012/09/What-Would-Jefferson-Do-2.4.pdf

Production Tax Credit

- Historically targeted wind and other large renewables
- Based on energy production over 10 years
- Original value of $0.015/kWh, annually adjusted for inflation
- Long legislative history with some drama sprinkled in

PTC Extensions and Expirations

Legislation	Enacted Date	Availability Period and Details
Energy Policy Act of 1992	10/24/1992	1/1/1993 – 6/30/1999 (6.5 yrs)
Ticket to Work & Work Incentives Improvement Act	12/17/1999	7/1/1999 – 12/31/2001 (2.5 yrs)
Job Creation and Worker Assistance Act	3/9/2002	1/1/2002 – 12/31/2003 (2 yrs)
Working Families and Tax Relief Act	10/4/2004	1/1/2004 – 12/31/2005 (2 yrs)
Energy Policy Act of 2005	8/8/2005	1/1/2006 – 12/31/2007 (2 yrs)
Tax Relief and Health Care Act of 2006	12/20/2006	1/1/2008 – 12/31/2008 (1 yr)
Emergency Economic Stabilization Act of 2008	10/3/2008	1/1/2009 – 12/31/2010 (2 yrs) 10/3/2008 – 12/31/2011 (marine) 1/1/2009 – 12/31/2009 (wind – 1 yr)

Credit expired before renewal

PTC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period and Details
American Recovery and Reinvestment Act	2/17/2009	1/1/2011 – 12/31/2013 1/1/2010 – 12/31/2012 (wind – 3 yrs) • *Ability to claim ITC in lieu of PTC (must be placed in service in 2009 – 2012)* • *Ability to claim grant in lieu of ITC (must commence construction in 2009 or 2010, later extended to 2011)*
American Taxpayer Relief Act of 2012	1/2/2013	1/1/2013 – 12/31/2013 (wind – 1 yr) • *Credit expiration changed to commenced construction date from placed in service date*
Tax Increase Prevention Act of 2014	12/19/2014	1/1/2014 – 12/31/2014 (1 yr) • *ITC in lieu of PTC extended retroactively through 2014*

Credit expired before renewal

PTC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period and Details

Consolidated Appropriations Act of 2016	12/18/2015	1/1/2015 – 12/31/2016 (2 yrs)
		1/1/2015 – 12/31/2019 (wind - 5 yrs)
		• *ITC in lieu of PTC extended to 12/31/2016*
		• *PTC phaseout for wind introduced. Dates are for beginning construction:*
		  • *20% reduction in 2017*
		  • *40% reduction in 2018*
		  • *60% reduction in 2019*

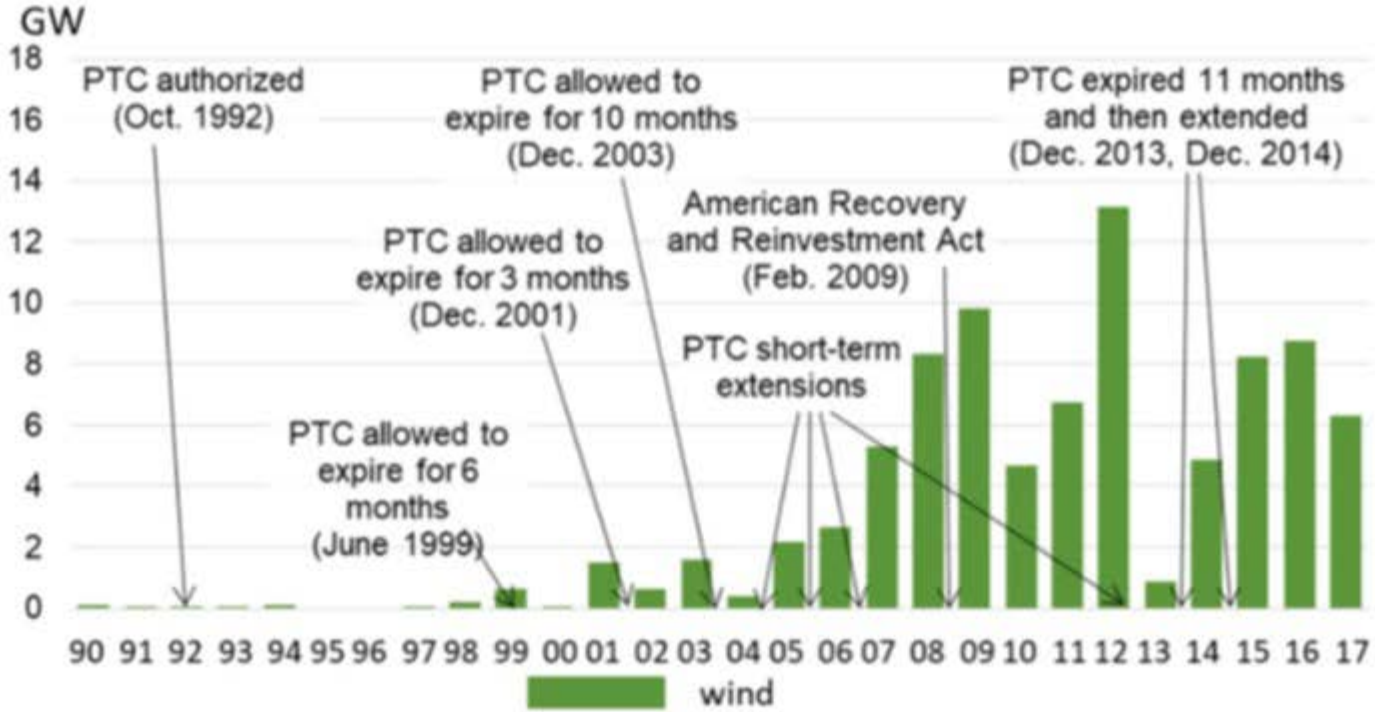
Bipartisan Budget Act of 2018	2/9/2018	1/1/2017 – 12/31/2017 (non-wind) • *ITC in lieu of PTC retroactively extended to 12/31/2017*
Further Consolidated Appropriations Act of 2020	12/20/2019	1/1/2018 – 12/31/2020 (all technologies) • *ITC in lieu of PTC extended to 12/31/2020* • *Wind phaseout extended: 40% reduction in 2020* * *Wind phaseout remained at 60% reduction for 2019* ** *PTC had previously expired for non-wind technologies before renewal*

Credit expired before renewal

PTC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period and Details
Consolidated Appropriations Act of 2021	12/27/2020	1/1/2021 – 12/31/2021 • *Wind phaseout extended: 40% reduction in 2020 and 2021*
Inflation Reduction Act	8/16/2022	1/1/2022 – 12/31/2024 • *Transitioning to technology-neutral credit through 2034 or later* • *Labor provisions* • *Bonus Credits*

PTC Expiration Impacts



Frazier, Allister, Marcy, Cara, & Cole, Wesley J. *Wind and solar PV deployment after tax credits expire: A view from the standard scenarios and the annual energy outlook*. United States. https://doi.org/10.1016/j.tej.2019.106637

Investment Tax Credit

- Historically targeted solar and other smaller renewables
- Based on system cost
- Value of 30% for most of its history
- Long legislative history with some drama sprinkled in

ITC Extensions and Expirations

Legislation	Enacted Date	Availability Period
Energy Tax Act of 1978	11/9/1978	10/1/1978 – 12/31/1982 • *10% for solar and wind (refundable)*
Crude Oil Windfall Profit Tax Act of 1980	4/2/1980	1/1/1980 – 12/31/1985 • *15% for solar and wind (non-refundable)* • *Additional technologies now eligible*
Tax Reform Act of 1986	10/22/1986	1/1/1986 – 12/31/1986 *15%* 1/1/1987 – 12/31/1987 *12%* 1/1/1988 – 12/31/1988 *10%*
Technical and Miscellaneous Revenue Act of 1988	11/10/1988	1/1/1989 – 12/31/1989 *10%*

Credit not applicable to wind

ITC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period
Omnibus Budget Reconciliation Act of 1989	12/19/1989	1/1/1990 – 9/30/1990 *10%*
Omnibus Budget Reconciliation Act of 1990	11/5/1990	10/1/1990 – 12/31/1991 *10%*
Tax Extension Act of 1991	12/11/1991	1/1/1992 – 6/30/1992 *10%*
Energy Policy Act of 1992	10/24/1992	10% credit made permanent
Energy Policy Act of 2005	8/8/2005	1/1/2006 – 12/31/2007 *30%*
Tax Relief and Health Care Act of 2006	12/20/2006	1/1/2007 – 12/31/2008 *30%*
Emergency Economic Stabilization Act of 2008	10/3/2008	1/1/2009 – 12/31/2016 *30%* • *Credit allowed to offset Alt. Minimum Tax* • *Small Wind (100 kW or less) made eligible, capped at $4,000*

Credit not applicable to wind

ITC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period
American Recovery and Reinvestment Act	2/17/2009	• *Ability to claim ITC in lieu of PTC (must be placed in service in 2009 – 2012, later extended)* • *Ability to claim grant in lieu of ITC (must commence construction in 2009 or 2010, later extended to 2011)*
Tax Increase Prevention Act of 2014	12/19/2014	• *ITC in lieu of PTC extended retroactively through 12/31/2014*

Consolidated Appropriations Act of 2016	12/18/2015	1/1/2017 – 12/31/2021
		• *Credit expiration changed to commenced construction date from placed in service date*
		• *ITC in lieu of PTC extended retroactively through 12/31/2019 for wind*
		• *Phaseout for PTC wind introduced:*
		  • *20% reduction in 2017*
		  • *40% reduction in 2018*
		  • *60% reduction in 2019*

ITC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period

Bipartisan Budget Act of 2018	2/9/2018	• *ITC for small wind extended and phaseout introduced:*
		  • *26% ITC in 2020*
		  • *22% ITC in 2021*

Further Consolidated Appropriations Act of 2020	12/20/2019	• *ITC in lieu of PTC extended to 12/31/2020*
		• *Phaseout for PTC wind amended:*
		  • *20% reduction in 2017*
		  • *40% reduction in 2018*
		  • *60% reduction in 2019*
		  • ***40% reduction in 2020***

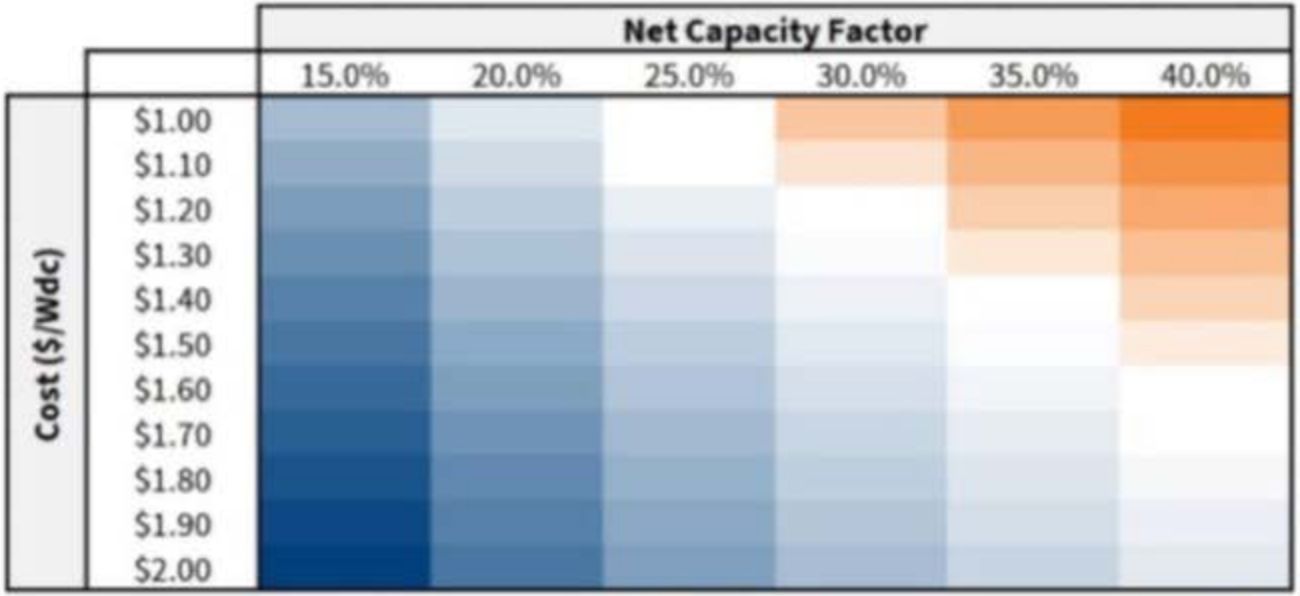
ITC Extensions and Expirations (Cont.)

Legislation	Enacted Date	Availability Period

Consolidated Appropriations Act of 2021	12/27/2020	• *ITC in lieu of PTC extended to 12/31/2021*
		• *Phaseout for PTC wind amended:*
		  • *20% reduction in 2017*
		  • *40% reduction in 2018*
		  • *60% reduction in 2019*
		  • ***40% reduction in 2020 and 2021***
		• *Phaseout for small wind amended*
		  • *26% ITC in 2020 – 2022*
		  • *22% ITC in 2023*
		• *New tax credit for offshore wind*

Inflation Reduction Act	8/16/2022	1/1/2022 – 12/31/2024 • *Transitioning to technology-neutral credit through 2034 or later* • *Labor provisions* • *Bonus Credits*

Solar PTC vs. ITC Comparison Chart



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The Inflation Reduction Act and the Wind Energy Industry

Inflation Reduction Act (IRA)

- A law passed in 2022 designed to address inflation, invest in domestic energy production and manufacturing, and reduce carbon emissions
- Largest investment in climate and energy in American history—$369 billion[1]
- Allocates funds through different mechanisms such as tax credits, loans, and grants.

Photo from Werner Slocum, NREL 66542

[1] The White House. 2023. "FACT SHEET: One Year In, President Biden's Inflation Reduction Act is Driving Historic Climate Action and Investing in America to Create Good Paying Jobs and Reduce Costs." https://www.whitehouse.gov/briefing-room/statements-releases/2023/08/16/fact-sheet-one-year-in-president-bidens-inflation-reduction-act-is-driving-historic-climate-action-and-investing-in-america-to-create-good-paying-jobs-and-reduce-costs/.

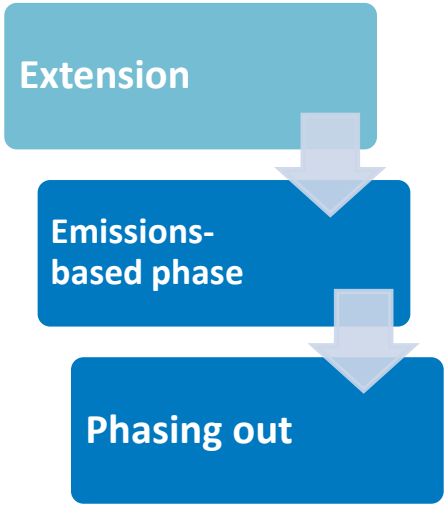
Inflation Reduction Act

- Investment Tax Credit (48) & Clean Electricity Investment Tax Credit (48E)
- Production Tax Credit (45) & Clean Electricity Production Tax Credit (45Y)

Photo by Dennis Schroeder. NREL 50697

IRA Impact on Key Tax Credits

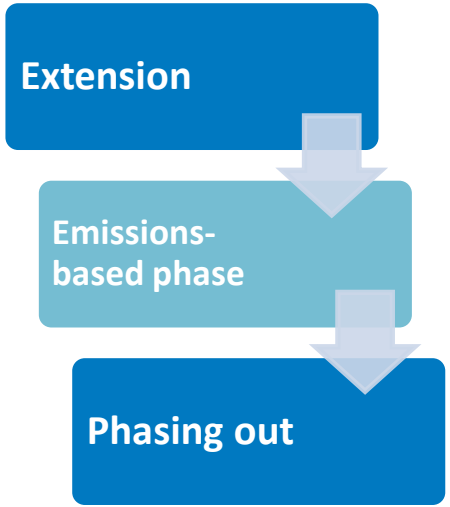
- IRA extends existing tax credits for wind energy projects under construction before 2025
- **PTC:** wind energy projects placed into service between Dec. 31, 2021 and January 1, 2025 receive an inflation-adjusted credit for 10 years[2]
  - For a project placed into service, the base PTC rate is 0.3 cents/kWh*inflation adjustment. If it meets PWA requirements the full PTC rate is 1.5 cents/kWh* inflation adjustment
  - Must meet prevailing wage and apprenticeship requirements or credit is 20% of this value
- **ITC:** IRA sets the ITC at **6% or 30%**, depending on project size and labor factors, through the end of 2024.[2]



[2] U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. 2023. "Advancing the Growth of the U.S. Wind Industry: Federal Incentives, Funding, and Partnership Opportunities." https://www.energy.gov/sites/default/files/2023-04/eere-wind-weto-funding-taxday-factsheet-fy23.pdf.

IRA Impact on Key Tax Credits (cont.)

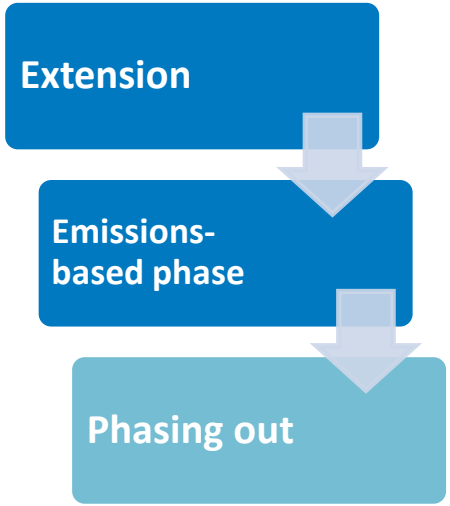
- In 2025, IRA will convert energy tax credits into emissions-based, technology-neutral tax credits available to power facilities with zero or net-negative carbon emissions
- Renewable Electricity PTC will become the **Clean Electricity PTC (45Y)**, set at 1.5 cents per kWh of electricity produced[3]
- Energy ITC will become the **Clean Electricity ITC (48E)**, set at 30% of investment.[3]



[3] Bipartisan Policy Center. 2022. *Inflation Reduction Act Summary*. https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2022/08/Energy-IRA-Brief_R04-9.26.22.pdf.

IRA Impact on Key Tax Credits (cont.)

- The Clean Electricity PTC (45Y) and Clean Electricity ITC (48E) will begin phasing out in 2032 or when total greenhouse gas emissions in the power sector decline to at least 75% below 2022 levels—whichever comes later[4]
- Phase out will take place gradually over four years.



[4] Bipartisan Policy Center. 2022. *Inflation Reduction Act Summary*. https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2022/08/Energy-IRA-Brief_R04-9.26.22.pdf.

Inflation Reduction Act

Investment Tax Credit (48) & Clean Electricity Investment Tax Credit (48E)

Production Tax Credit (45) & Clean Electricity Production Tax Credit (45Y)

Prevailing Wage and Apprenticeship Multiplier

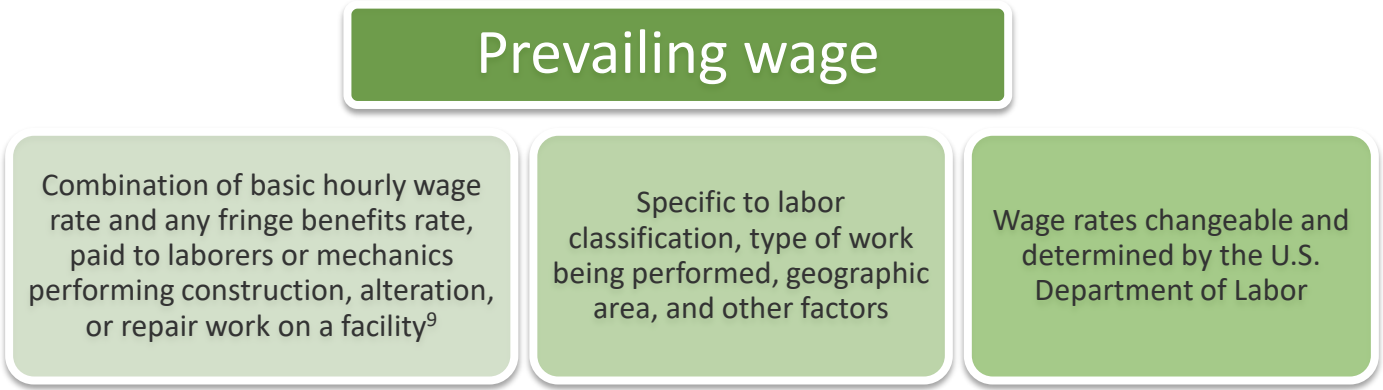
Photo by Dennis Schroeder. NREL 50697

Workforce Provisions

- IRA aims to create and sustain good-paying jobs in the renewable energy sector, as well as to support essential workforce development activities
- To receive increased tax credits through the IRA, taxpayers must meet certain labor requirements, referred to as the IRA prevailing wage and apprenticeship (IRA PWA):

Prevailing Wage

- To receive the full rate for certain IRA tax credits, the taxpayer must ensure that employees are paid a **prevailing wage**, which:
  - Encourages fair, family-sustaining pay
  - Attracts workers to jobs in the renewable energy industry.



[9] U.S. Department of Labor Wage and Hour Division. "Prevailing Wage and the Inflation Reduction Act." https://www.dol.gov/agencies/whd/IRA.

Apprenticeships

- Registered apprenticeship programs allow individuals to "obtain paid work experience, receive progressive wage increases, classroom instruction, and a portable, nationally-recognized credential"[10]
  - Support high-quality career pathways for workers
  - Ensure there is a trained workforce available for the renewable energy industry
- The apprenticeship provisions of IRA include three requirements:

Labor Hours Requirement

12.5 or 15 percent* of the total labor hours performed on the project must be performed by qualified apprentices from a registered apprenticeship program.[10]

Ratio Requirement

the applicable ratio of apprentices to journey-workers established by the registered apprenticeship program are met for apprentices working on the facility each day.[10]

Participation Requirement

any taxpayer that employs four or more laborers or mechanics must also hire at least one qualified apprentice.[10]

* Percentage dependent on when construction began.

[10] ApprenticeshipUSA. "Inflation Reduction Act Apprenticeship Resources." https://www.apprenticeship.gov/inflation-reduction-act-apprenticeship-resources.

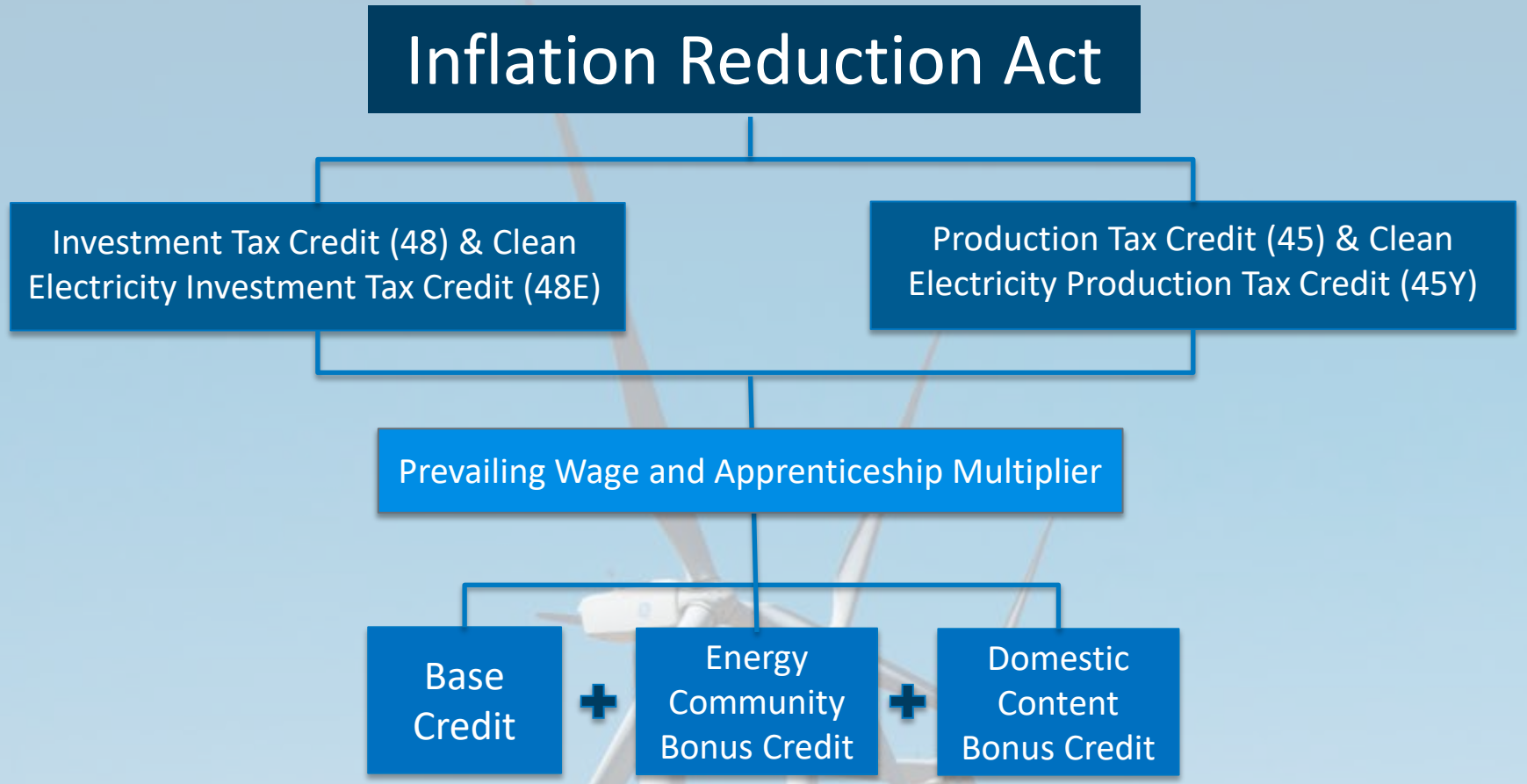


Photo by Dennis Schroeder. NREL 50697

Multipliers and Bonus Credits

- IRA incentivizes certain equity and workforce-related actions through multipliers and bonus credits:
  - Projects can increase (i.e., multiply by five) their base credits by meeting prevailing wage and apprenticeship requirements
  - Projects can receive stackable bonus credits that increase the ITC and PTC value if they:
    - Are located in energy communities (10%)
    - Meet domestic content thresholds (10%)

  For projects less than 5 MW_{AC} claiming the ITC – *can only claim one*

    - Are located in low-income communities (10%) or on tribal lands (10%)
    - Qualify as a low-income residential building (20% credit) or economic benefit project (20% credit).[5]

Photo from Black Hills Energy, 47185

[5] U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. 2023. "Advancing the Growth of the U.S. Wind Industry: Federal Incentives, Funding, and Partnership Opportunities." https://www.energy.gov/sites/default/files/2023-04/eere-wind-weto-funding-taxday-factsheet-fy23.pdf.

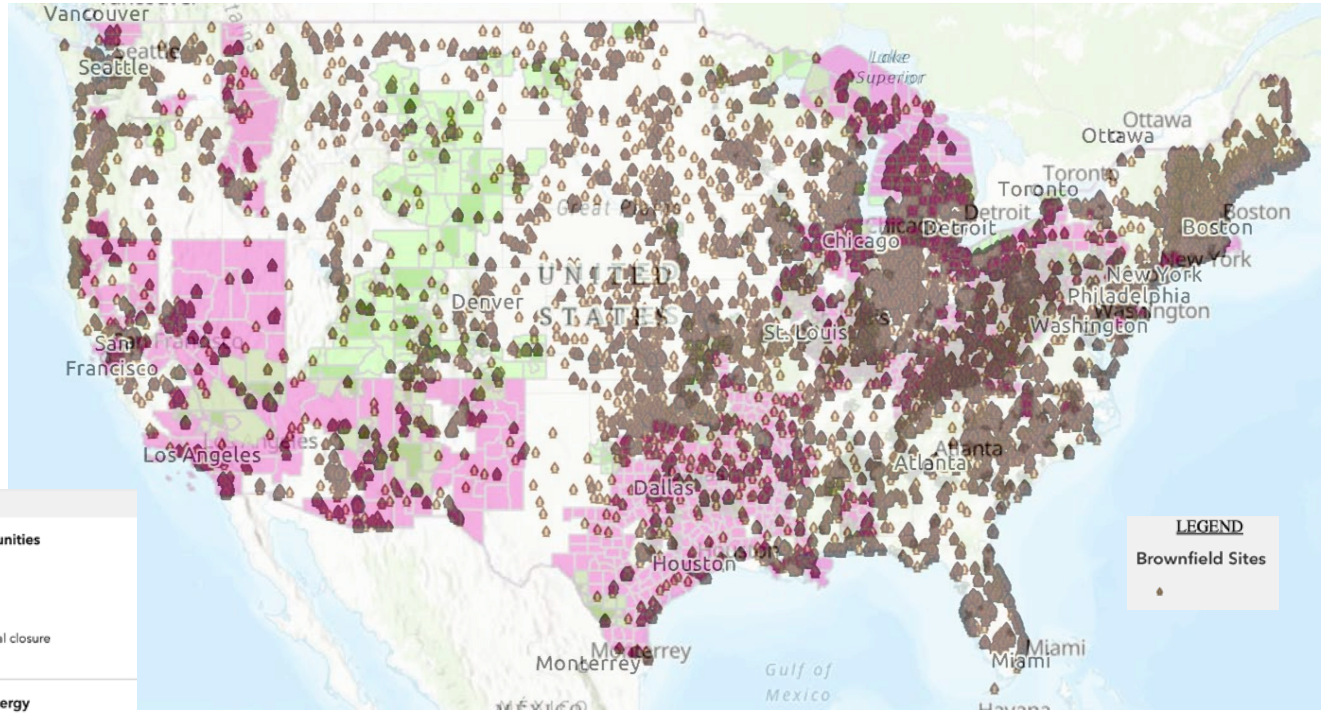
Energy Communities Bonus Credit

- One purpose of IRA is to support a just transition to renewable energy that equitably invests in and creates opportunities for communities and workers
- IRA provides a 10% bonus tax credit for projects located in **energy communities**, which are defined as meeting at least one of three criteria:

Brownfield sites	Small parcels of pollution-contaminated land designated by the U.S. Environmental Protection Agency or state governments for cleanup
Coal communities	A census tract (or directly adjoining census tract) in which a coal mine has closed after 1999; or in which a coal-fired electric generating unit has been retired after 2009[6]
Jobs and tax revenue	A statistical area that has or had (after 2009): 0.17% or greater direct employment or 25% or greater local tax revenues related to the extraction, processing, transport, or storage of coal, oil, or natural gas; and an unemployment rate higher than national average.[6]

[6] U.S. Department of the Treasury. 2024. "Treasury Releases Additional Guidance to Drive Investment to Energy Communities As Part of President Biden's Investing in America Agenda." https://home.treasury.gov/news/press-releases/jy2203.

Where are IRA energy communities?



LEGEND

2024 Coal Closure Energy Communities

Tract Status

- Census tract with a coal closure
- Directly adjoins a tract with a coal closure

2024 MSAs/non-MSAs that are Energy Communities

- MSAs/non-MSAs that meet both the Fossil Fuel Employment (FFE) threshold and the unemployment rate requirement and are an energy community as of June 7, 2024

Screenshots from the Energy Community Tax Credit Bonus Map and the Energy Communities IWG Site Review Tool; these show the communities that qualify as energy communities in the continental U.S., Hawaii, and Alaska.
Maps from U.S. Department of Energy and National Energy Technology Laboratory.

IRA Energy Communities and Wind Energy

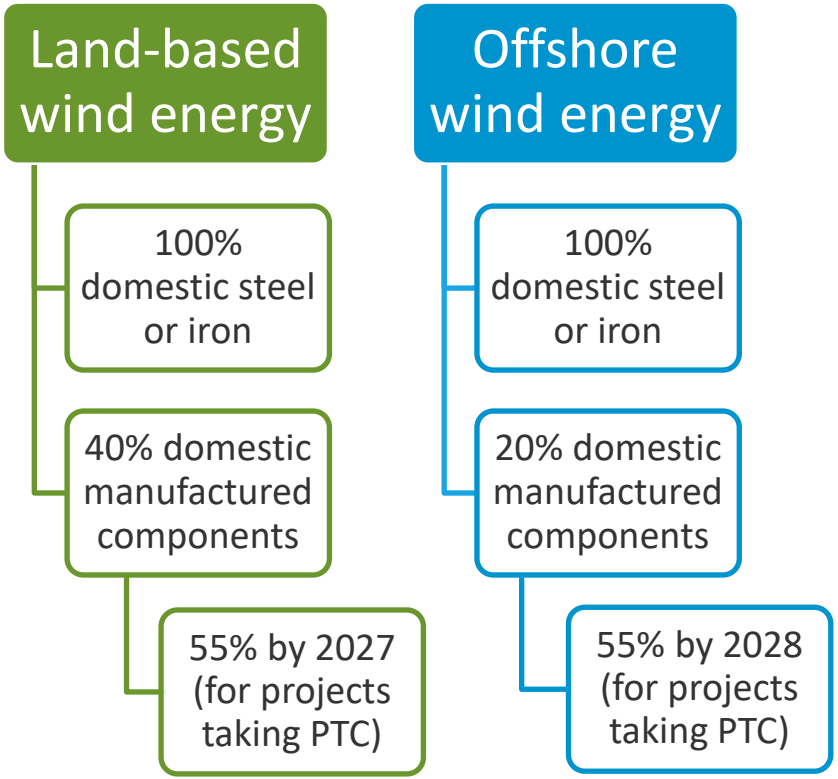
Components for the South Fork Wind offshore wind energy project are staged at the State Pier port facility in New London, Connecticut in January 2024. Photo by Matilda Kreider, NREL

- For land-based wind energy, there are many energy communities across the country where projects are likely to be sited
- Offshore wind energy projects can attribute their nameplate capacity to their onshore power conditioning and transfer equipment (e.g., substations) or certain port facilities
  - Depending on where those equipment and facilities are, this could allow them to access the Energy Communities Tax Credit Bonus.[7]

[7] U.S. Department of the Treasury. 2024. "Treasury Releases Additional Guidance to Drive Investment to Energy Communities As Part of President Biden's Investing in America Agenda." https://home.treasury.gov/news/press-releases/jy2203.

Domestic Content Bonus Credit

- IRA aims to invest in and expand U.S. manufacturing for the clean energy industry
- IRA provides an additional 10% credit to taxpayers that build their projects using 100% domestic steel and iron and a certain percentage of manufactured products that were mined, produced or manufactured in the United States.[8]



[8] Internal Revenue Service. "Notice 2023-38. Domestic Content Bonus Credit Guidance under Sections 45, 45Y, 48, and 48E." https://www.irs.gov/pub/irs-drop/n-23-38.pdf.

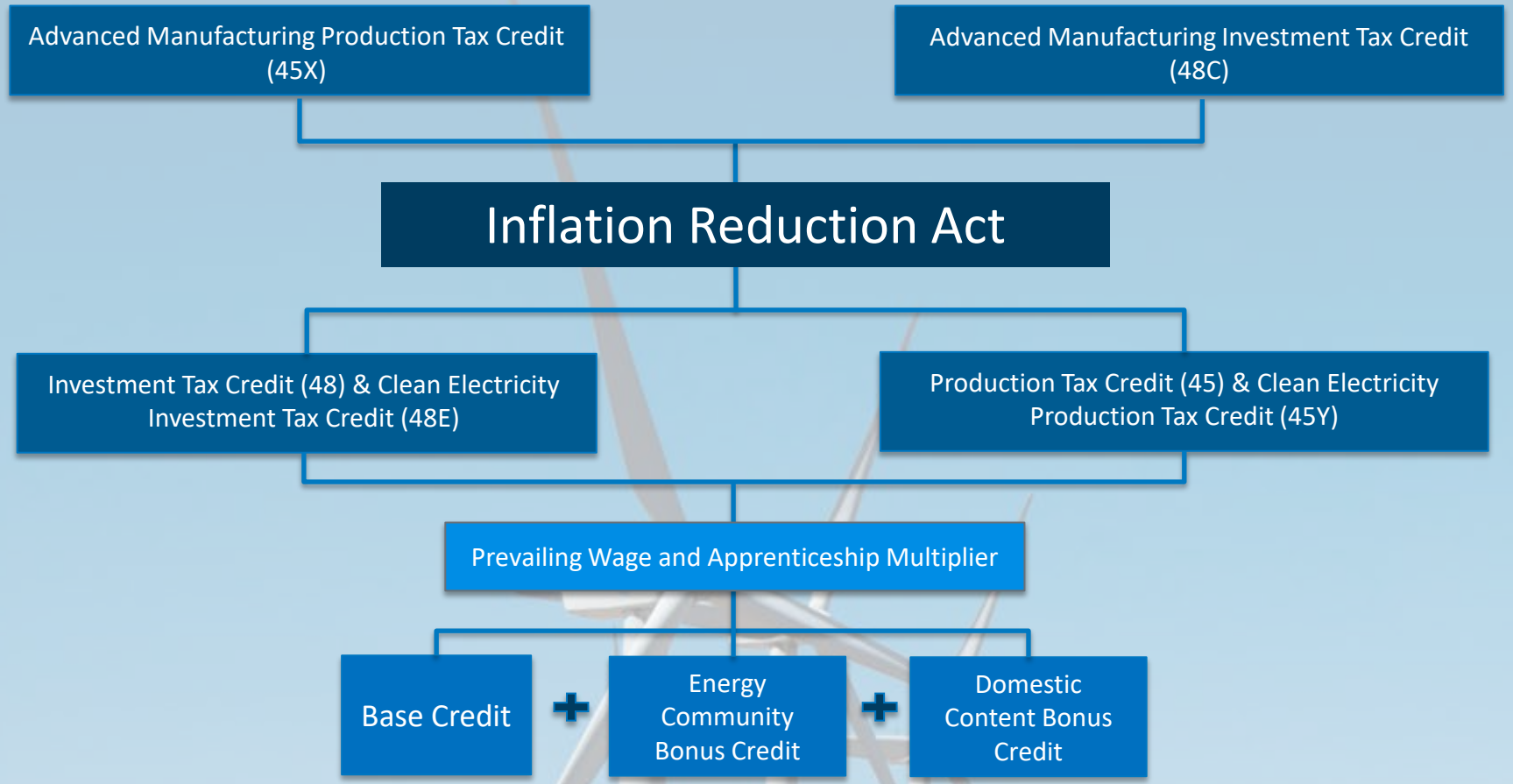


Photo by Dennis Schroeder. NREL 50697

Advanced Manufacturing Production Tax Credit

- To drive investment in U.S. manufacturing, IRA includes a variety of manufacturing tax credits
- The **Advanced Manufacturing PTC (45X)** was created for companies that manufacture and sell clean energy equipment in the U.S. between 2023 and 2032
- For most wind energy components, the amount of the credit varies by component type and is multiplied by the rated capacity of the associated turbine (in watts).[11]

Component	Tax Credit Amount
Nacelle	5 cents per watt
Tower	3 cents per watt
Fixed-bottom offshore wind turbine platform	2 cents per watt
Floating offshore wind turbine platform	4 cents per watt
Distributed wind inverter	11 cents per watt
Critical minerals	10% of cost incurred to produce the mineral
Offshore wind energy vessels	10% of vessel's sale price

[11] U.S. Department of Energy Office of Energy Efficiency and Renewable Energy. "Advancing the Growth of the U.S. Wind Industry: Federal Incentives, Funding, and Partnership Opportunities." https://www.energy.gov/sites/default/files/2023-04/eere-wind-weto-funding-taxday-factsheet-fy23.pdf.

Advanced Manufacturing Investment Tax Credit

- IRA reestablishes the Advanced Manufacturing ITC (48C), sometimes referred to as the Advanced Energy Project Credit, which is a competitively awarded up to 30% ITC
  - IRA provides $10 billion to be competitively awarded for these projects, with at least $4 billion awarded to investments in energy communities[11]
- Wind energy component manufacturing and recycling facilities qualify[12]
- Facilities receiving 48C credits may not also receive Advanced Manufacturing PTC (45X) credits.

Photo by Jonathan Keller, NREL 49050

[12] U.S. Department of Energy Office of Energy Efficiency and Renewable Energy. "Advancing the Growth of the U.S. Wind Industry: Federal Incentives, Funding, and Partnership Opportunities." https://www.energy.gov/sites/default/files/2023-04/eere-wind-weto-funding-taxday-factsheet-fy23.pdf.

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Photo from Werner Slocum, NREL 66531

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