

Appendix F: R&D tax incentives by state

Most states offer R&D tax credits, and model their credit after the federal R&D tax credit (Credit for Increasing Research Activities). The federal R&D tax credit was established in 1981 as part of the Economic Recovery Tax Act of 1981. The original primary formula was an incremental credit based on historical R&D expenses. This formula was established to reward companies for increases in R&D spending rather than existing spending, lessening the potential for rewarding activity that would have occurred in the absence of the credit and limiting the revenue impact of the incentive program. The legislation also spelled out certain tests for determining qualified research activity and expenditures for the tax credit. The federal R&D tax credit has undergone several modifications since its introduction. The most significant change occurred in 2009, when the Alternative Simplified Credit (ASC) calculation method was introduced. This calculation provides a simplified calculation using a moving average base instead of the historical bases used in the regular method but reimburses a lower rate of incremental qualified expenditures.

Minnesota was the first state to introduce an R&D credit in 1981. Virginia is a relatively late entrant, establishing its first R&D tax credit in 2011. By 2010, 37 states already had R&D tax credits. Eight states that earlier offered R&D expenses tax credits have repealed them or allowed them to expire. They include Oregon (2018), North Carolina (2015), Washington (2014), Oklahoma and West Virginia (2013), Michigan (2012), Montana (2010), and Missouri (2005).

As of 2021, 35 states offer an R&D expenses tax credit (Table F-1). Although most states model their tax credits on the federal incremental and alternative credit formulas, there are a handful of exceptions. For example, Utah offers a volume credit based on a 7.5% fixed rate of qualified research expenditures. Three states offer more restrictive types of R&D tax credits: Colorado restricts its tax credit to state enterprise zones; Kentucky offers a tax credit for costs of constructing, remodeling, expanding, and equipping facilities for qualified research; and Mississippi has a tax credit for research costs resulting from research agreements with a Mississippi public university or research corporation. New York attaches job creation requirements to its Excelsior Research and Development Tax Credit. A handful of states apportion the federal credit based on the amount of total U.S. R&D qualified research expenditures made in the state, including Alaska, Nebraska, New York, and Vermont.

States also commonly utilize the federal tests for qualified research and definition of qualified expenditures, though there are some state programs that vary slightly from this model. Arkansas offers an “In House Tax Credit” that excludes contract expenditures permitted by the federal credit. Hawaii qualifies other research activities that fall outside the boundaries of the federal credit such as “performing arts products.” New Mexico utilizes custom state eligibility guidelines, and New Hampshire counts only qualifying wages as an eligible expenditure.

States also vary along various design dimensions of the tax credits, such as the credit rate, refundability/transferability, and rollover period. For states employing an incremental credit, the average credit rate offered on the regular tax credit ranges from a minimum of 3 percent to a maximum of 33 percent, with a mean low-high range of 9.5%–13%. Higher rates are often reserved for small businesses or other categories of targeted firms. Nine states (including Virginia) offer refundable credits, while three offer transferable credits. Seven of these states restrict refundability or transferability to

designated small businesses. For nonrefundable and nontransferable tax credits, rollover periods are usually long in comparison to other types of tax credits, ranging from no carry forward (Texas) to an unlimited time rollover period, with the median being 10 years. Virginia is one of seven states that have a statewide annual cap on program expenditures. Virginia's R&D expenses tax credit has an annual cap of \$7.77 million, and the major R&D tax credit has an annual cap of \$24 million as of 2021. The others include Arizona (\$5 million for refundable credits), Florida (\$9 million), Maryland (\$12 million), New Hampshire (\$7 million), New York (\$250 million), and Pennsylvania (\$55 million). Virginia's R&D expenses tax credit also has a per company cap of \$45,000 (or \$60,000 if conducted with a Virginia higher education institution). At least three other states have individual taxpayer credit allocation caps (Arkansas \$10,000–\$50,000; Maryland \$250,000; and New Hampshire \$50,000), while 12 states limit the amount of a credit earned that can be applied against an individual year's tax liability.

Beneficial treatment of certain types of activities, industries, or businesses are a common feature of state R&D tax credits. As mentioned previously, seven of the 12 states offering refundable or transferable credits restrict them to small businesses. Several states offer more favorable tax credit rates to small businesses (such as Louisiana, New York, and Virginia) or step down the credit rate for incremental expenditures over a base amount (such as Indiana, Minnesota, and Rhode Island). A handful of states, including Virginia, provide incentives for research conducted in collaboration with state colleges and universities (including Arizona, Arkansas, and Nebraska), for "basic research" (Maine), for clean energy or "Green project" research (New York and Wisconsin), and for firms located in enterprise zones or rural areas (Colorado and New Mexico).

Thirty-six states offer sales and use tax exemptions for the purchase of supplies and equipment used in R&D (Table F-2). Five other states have no sales and use tax. The state exemptions differ along several dimensions, including requirements in terms of the type of purchases covered (e.g., equipment, supplies), whether the purchases must adhere to the strict "direct and exclusive" standard or a less stringent "predominant use" standard, industry targeting, and the amount of the exemption. All states with an exemption provide it for purchased equipment, but only 18 offer the same for supplies used in R&D. Nine states use the same "directly and exclusively" standard as applied to the Virginia exemption, with the remainder either using a weaker "predominantly" or undeclared standard. Some states limit their exemption to certain industries. Ten of the states restrict the R&D exemption to manufacturing industries, one to mining (Utah), and five to certain high-technology related firms or sectors. Three states (California, Connecticut, and Mississippi) offer only "partial" sales and use exemptions on qualified purchases.

TABLE F-1
R&D tax credits by state

State	Name	Year	Type (incremental/ average)	Transferable/ refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Alaska		1981	Incremental	--	Federal	20 years	18% of allocated federal credit	
Arizona	Research and Development Income Tax Credit	1992	Incremental	Refundable for small businesses	Federal	15 years	15–24% of incremental research expenditures	An additional 10% credit amount is available for basic research payments to an Arizona university. 75% of credit is refundable for firms that employ fewer than 150 full-time employees.
Arkansas	Research and Development Tax Credits	2003	Incremental	--	Federal test for R&D. In house research does not include contract research expenses.	9 years	20–33% of incremental research expenditures	Four tax credits are offered: (1) University-based R&D-33% incremental credit for business that contracts with Arkansas colleges or universities in performing research; (2) In-house R&D-20% credit for conducting "in-house" research that qualifies for federal research and development tax credits may qualify for in-house research income tax credits; (3) R&D in Area of Strategic Value-33% credit for in-house research by businesses that invest in areas of strategic value; (4) In-house research by a targeted business:-33% credit offered for targeted businesses, at the discretion of the Arkansas Economic Development Commission Executive Director.
California	Research and Development Tax Credit	1987	Incremental	--	Federal	unlimited	15% of incremental research expenditures	Incremental rate is 24% for basic research expenses in excess of a computed base amount. The Alternative Incremental Credit provides percentage credits of 1.49%, 1.98% and 2.48%.
Colorado	Enterprise Zone Research and Development Tax Credit	2012 or NA	Incremental	--	Federal	unlimited	3% of incremental research expenditures	Credit usage restricted to enterprise zones.
Connecticut	Research and Development Incremental Expenditures Tax Credit	1986	Incremental	Partly refundable for qualified small businesses	Federal	15 years	20% of incremental research expenditures	A qualified small business without tax liability can receive a refundable credit equal to 65% of the face value of the credit. A qualified small business is a company that has gross income for the previous tax year of less than or equal to \$70 million.

Appendixes

State	Name	Year	Type (incremental/ average)	Transferable/ refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Delaware	Research and Development Tax Credit	2017	Incremental	Refundable	Federal	None	10%–20% of incremental research expenditures	50–100% of federal R&D tax credit calculated using alternative incremental credit method. 20% incremental rate and 100% alternative incremental credit rate are for small businesses. A small business is a business with less than \$20 million in average gross receipts.
Florida	Research and Development Tax Credit	2011	Incremental	--	Federal	5 years	10% of incremental research expenditures	The maximum tax credit for a business enterprise less than 5 years old is 25 percent. Only businesses in manufacturing, life sciences, information technology, aviation and aerospace, homeland security and defense, cloud information technology, marine sciences, materials science, and nanotechnology industries may qualify for the credit.
Georgia	Research and Development Tax Credit	1998	Incremental	--	Federal, except that all wages paid+G21 and all purchases of services and supplies must be for research conducted within the state of Georgia.	10 years	10% of incremental research expenditures	This credit applies to facilities in the Strategic Industries (Strategic Industries: Manufacturing Warehousing and Distribution, Processing, Telecommunications, Broadcasting, Tourism, Research and Development Facilities, Biomedical Manufacturing) as well as dedicated R&D facilities.
Hawaii	Tax Credit for Research Activities	1999	Incremental	Refundable	See "Other"	None	20% of qualified research expenditures	Qualified high technology business" means a business that conducts more than 50 percent of its activities in qualified research. "Qualified research" means: (1) the same as in section 41(d) of the Internal Revenue Code; (2) the development and design of computer software for ultimate commercial sale, lease, license or to be otherwise marketed, for economic consideration. With respect to the software's development and design, the business shall have substantial control and retain substantial rights to the resulting intellectual property; (3) biotechnology; (4) performing arts products; (5) sensor and optic technologies; (6) ocean sciences; (7) astronomy; or (8) non-fossil fuel energy-related technology.

Appendixes

State	Name	Year	Type (incremental/ average)	Transferable/ refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Idaho	Credit for Idaho Research Activities	2001	Incremental	--	Federal	14 years	5% of incremental research expenditures	
Illinois	Research and Development Tax Credit	1990	Incremental	--	Federal	5 years	6.5% of incremental research expenditures	
Indiana	Research and Development Tax Credit	1963	Incremental	--	Federal	10 years	10–15% of incremental research expenditures	The credit rate is 15% up to \$1 million. Thereafter, the credit rate is 10%. Alternative credit rates are available using 10% rate for qualified expenditures based on three previous years and 5% rate if no qualified expenditure history is available.
Iowa	Research Activities Credit	1985	Incremental	Refundable	Federal	1 year	6% of incremental research expenditures	The Alternative Simplified Credit is 4.55%. Supplemental Research Activities Credits are available through the Enterprise Zone and High Quality Jobs programs.
Kansas	Research and Development Credit	1988	Incremental	--	Federal	unlimited	6.5% of incremental research expenditures	Only 25% of credit awarded may be used in individual tax year.
Kentucky	Qualified Research Facility Tax Credit	2002	Other	--	NA	10 years		A credit of 5% of the qualified costs of construction, remodeling, expanding and equipping facilities in Kentucky for "qualified research."
Louisiana	Research and Development Tax Credits	2002	Incremental		Federal	5 years	5%–30% of incremental research expenditures	Credit rate is based on size of the business: (a) 5% if the business employs 100 or more, (b) 10% if it employs 50–99 workers, (c) 30% if the business employs less than 50 persons. The following types of businesses that do not have a pending or issued U.S. patent directly related to the qualified research are ineligible to apply for or receive tax credits, unless specifically invited by the secretary of the department to do so: (a) professional services firms as defined by departmental rule and (b) businesses primarily engaged in custom manufacturing and custom fabricating as defined by departmental rule.

Appendixes

State	Name	Year	Type (incremental/average)	Transferable/refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Maine	Research Expense Tax Credit	2007	Incremental	--	Federal	15 years	5% of incremental research expenditures	The base credit rate is 5% and 7.5% for basic research. The credit is limited to 100% of the first \$25,000 in tax liability in excess of \$25,000.
	Super Research and Development Tax Credit	2013	Incremental	--	Federal	5 years		The Super R&D Credit is based on qualified research payments exceeding 150% of the average for the three-year period prior to the effective date of the credit. The credit is limited to 50% of the tax otherwise due after all other credits. The credit can be carried forward for up to five years.
Maryland	Research and Development Tax Credit	2010	Incremental	Refundable for small businesses	Federal	7 years	10% of incremental research expenditures	Basic R&D Tax Credit: 3% of eligible R&D expenses that do not exceed the Maryland Base Amount. Growth R&D Tax Credit: 10% of eligible R&D expenses in excess of the Maryland Base Amount. Program cap is \$6.5 million. A small business is defined as a business with net book value assets of \$5 million.
Massachusetts	Research and Development Tax Credit	1991	Incremental	-	Includes only wage portion of contract expenses	15 years	10% of incremental research expenditures	The credit amount is limited to the first \$25,000 of tax liability, plus 75% of any liability in excess of \$25,000.
Minnesota	Research and Development Tax Credit	1981	Incremental	--	Federal	15 years	4–10% of incremental research expenditures	The R&D credit is equal to 10% of qualifying expenses up to \$2 million, and 4% for expenses above that level.

Appendixes

State	Name	Year	Type (incremental/average)	Transferable/refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Mississippi	Strengthening Mississippi Academic Research Through (SMART) Business Act	2013	Other	Rebate	Qualified research costs means costs paid or incurred by an investor to a college or research corporation for qualified research undertaken, according to a research agreement.	NA		The SMART Business Act is a program that allows approved investors who incur qualified research costs as a result of having entered into a new research agreement with a Mississippi public university or research corporation to receive a rebate equal to 25% of the investor's qualified research costs not to exceed \$1,000,000. The total amount of rebates issued each fiscal year may not exceed \$5,000,000.
Nebraska	Nebraska Advantage Research and Development Credit	2009	Federal	--	Federal	20 years	15%–35% of allocated federal credit	The base credit is 15%. The credit is increased to 35% for expenditures at a state college or university.
New Hampshire	Research and Development Tax Credit	2007	Incremental	--	Qualifying wages only	5 years	10% of incremental research expenditures	Taxpayer cap is \$50,000. Program cap is \$7,000,000.
New Jersey	Research and Development Tax Credit	1993	Incremental	Transferable for small businesses	Federal	7 years	10% of incremental research expenditures	

Appendixes

State	Name	Year	Type (incremental/average)	Transferable/refundable	Basis (federal/other)	Carry forward period	Rate*	Other
New Mexico	Technology Jobs and Research and Development Tax Credit	2000	Other	Refundable for small businesses	State defined eligible expenditures	3 years	5–10% of incremental research expenditures	A taxpayer that employs no more than 50 employees, has qualified expenditures of no more than \$5 million, and who conducts qualified research and development at a facility in the state is allowed a basic tax credit equal to 5% of qualified expenditures, and an additional 5% credit toward income tax liability by raising its in-state payroll \$75,000 for every \$1 million in qualified expenditures claimed. The tax credit doubles for expenditures in facilities located in rural New Mexico (as defined for this tax credit as anywhere outside a three-mile radius of an incorporated municipality with a population of 30,000 or more).
New York	Excelsior Research and Development Tax Credit:	NA	Federal	--	Federal	Unlimited	50% of allocated federal credit	A credit of 50% of the portion of the federal R&D tax credit that relates to in-state expenditures, credit up to 6% of research expenditures attributable to activities conducted in-state. For a qualified green project, a credit of 50% of the portion of the federal R&D tax credit for in-state expenditures up to 8% of research expenditures attributable to activities conducted in-state. Businesses must create 5–100 jobs depending on the industry and be in certain strategic industries.
	Life sciences research and development tax credit	2018	Incremental	Refundable	Federal	None	15–20% of incremental research expenditures	The credit is equal to: 15% of the qualified life sciences company's R&D expenditures in New York State for a company that employs 10 or more persons. 20% of the qualified life sciences company's R&D expenditures in New York state for a company that employs fewer than 10 persons.
North Dakota	Research Expense Credit	2007	Incremental	Transferable for small businesses		15 years	25% for incremental research expenditures for first \$100,000. 8% of additional incremental research	A small business, defined as a primary sector business with annual gross revenues of less than \$750,000 may transfer up to \$100,000 of its unused tax credit.

Appendixes

State	Name	Year	Type (incremental/ average)	Transferable/ refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Ohio	Research & Development Investment Tax Credit	2002	Incremental	--	Federal	7 years	7% of incremental research expenditures	
Pennsylvania	Research and Development Tax Credit Assignment Program	1997	incremental	Transferable	Federal	15 years	10% of incremental research expenditures	\$15 million annual cap. Up to 20% of total pool set aside for small businesses.
Rhode Island	Research and Development Expenses Credit	2003	Incremental	--	Federal	7 years	16.9–22.5% of incremental research expenditures	The credit is 22.5% for expenses up to \$111,111 and 16.9% for the remaining expenses over \$111,111.
South Carolina	Research and Development Credit	2001	Incremental	--	Federal	10 years	5% of incremental research expenditures	
Texas	Franchise Tax Credit for Qualified Research and Development Activities	2014	Incremental	--	Federal	None	5% of incremental research expenditures	
Utah	Research Activities Credits	1998	Incremental and fixed rate	--	Federal	14 years	5% of incremental research expenditures or 7.5% of qualified research expenditures	
Vermont	Research and Development Tax Credit	2003	Federal	--	Federal	10 years	27% of allocated federal credit	

Appendixes

State	Name	Year	Type (incremental/ average)	Transferable/ refundable	Basis (federal/other)	Carry forward period	Rate*	Other
Virginia	Research and Development Expenses Tax Credit	2011	Incremental	Refundable for small businesses	Federal	None	15–20% of incremental research expenditures	Tax credit for qualified R&D expenses. Credit is equal to 15% of first \$300,000 of expenses or 20% if conducted with Virginia higher education institution. Alternatively, credit may be computed as 10% of difference of expenses and 50% of previous 3-year average.
	Major Research and Development Tax Credit	2016	Incremental	--	Federal	10 years	10% of incremental research expenditures	Tax credit for qualified R&D expenses greater than \$5 million. Credit is based on difference between R&D expenses during taxable year and 50% of the average expenses incurred during previous 3 years. The credit amount claimed by a taxpayer cannot exceed 75 percent of the taxpayer's Virginia income tax liability for the taxable year.
Wisconsin	Research Expense Credit	2007	Incremental	--	Federal	15 years	5.75–11.5% of incremental research expenditures	The base research expense credit is equal to 5.75%. A credit of 11.5% is available for qualified R&D related to designing internal combustion engines vehicles, energy efficient lighting systems, building automation and control systems, or automotive batteries for use in hybrid-electric vehicles.

SOURCE: Weldon Cooper Center Analysis based on Wolters Kluwer VitalLaw; Healy Schadewald, and Nelson (2021), Pennsylvania Independent Fiscal Office (2020), and Schmidt (2021)

NOTE: *When both Regular rate and Alternative rate are offered, only the former is shown. Alabama, DC, Michigan, Missouri, Montana, Nevada, North Carolina, Oklahoma, Oregon, South Dakota, Tennessee, Washington, West Virginia, and Wyoming do not have R&D tax credits.

TABLE F-2
R&D sales tax exemptions by state

State	Equipment used in R&D	Materials used or consumed in R&D	Must be "directly and exclusively" used in R&D	Must be "predominantly" used in R&D	Additional restrictions
Arizona	X				
California	X			Must be primarily used in R&D (i.e., 50% or more of the time).	Partial, rate of 3.9375% Biological sciences (NAICS code 541711) or physical sciences (NAICS code 541712).
Colorado	X			Directly and predominantly	Biotechnology
Connecticut	X				Partial (50% of sales tax) Manufacturing
Florida	X	X		X	
Idaho	X	X	Primarily		
Illinois	X	X			Manufacturing
Indiana	X	X	X		
Iowa	X	X	Directly and primarily		
Kansas	X				Manufacturing
Kentucky	X				Economic development project; construction materials

Appendixes

State	Equipment used in R&D	Materials used or consumed in R&D	Must be "directly and exclusively" used in R&D	Must be "predominantly" used in R&D	Additional Restrictions
Louisiana	X				University research parks, construction materials
Maine	X		X		
Maryland	X	X		X	
Massachusetts	X	X	X	X	R&D by a manufacturing corporation or a research and development (i.e., principal activity is R&D) company.
Michigan	X	X			"Industrial processing activities"
Minnesota	X				Manufacturing, fabricating, mining, or refining
Mississippi	X				Restricted, at reduced sales tax rate of 1.5%. Requirements: (1) employ at least 10 persons full-time; (2) at least 10% of workforce is scientists, engineers, or computer specialists; (3) the enterprise manufactures plastics, chemicals, automobiles, aircraft, computers, or electronics; or shall be a research and development facility, a computer design or related facility, or a software publishing facility or other technology intensive facility; (4) the average wage is at least 150% of the state average annual wage; and (5) the enterprise provides a basic health care plan to all employees at the facility.
Missouri	X	X			Manufacturing, processing, compounding, mining, or producing any product
New Jersey	X	X	X		Directly and exclusively
New York	X	X			Directly and predominantly

Appendixes

State	Equipment used in R&D	Materials used or consumed in R&D	Must be "directly and exclusively" used in R&D	Must be "predominantly" used in R&D	Additional Restrictions
North Carolina	X	X			Physical, engineering, and life sciences or software publishing.
North Dakota	X		Directly		Manufacturing
Ohio	X				
Oklahoma	X	X			Qualified computer services, data processing, or research and development facility. Refundable
Pennsylvania	X	X		Directly and predominantly	Manufacturing
Rhode Island	X				
South Carolina	X		Directly and primarily		
Tennessee	X		Primarily		
Texas	X	X	X		
Utah	X			X	Mining
Vermont	X	X	X		
Virginia	X	X	X		
Washington	X		Directly	X	
West Virginia	X	X	X		
Wisconsin	X		X		

SOURCE: Weldon Cooper Center Analysis based on Wolters Kluwer VitalLaw; Healy Schadewald, and Nelson (2021); Joint Subcommittee to Evaluate Tax Preferences (2015); and state Departments of Taxation and Revenue websites.