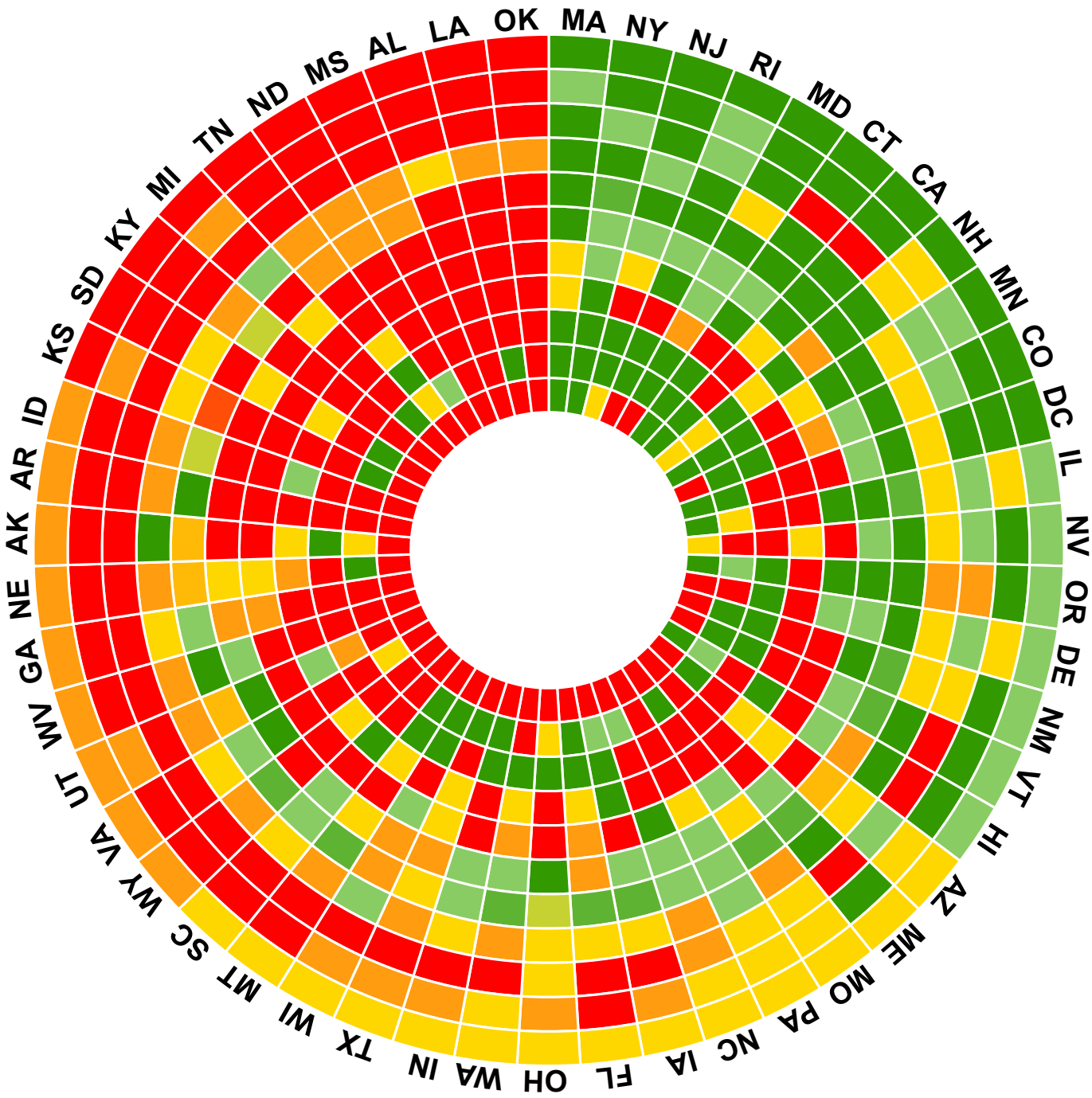
2020 State Solar Power Rankings Report

Instructions: Roll over or tap on any segment of the chart to populate the boxes below with the state's grades and 2019 solar outlook.

How to read the report:

This chart ranks the 50 states and the District of Columbia, from best (green) to worst (red), based on their solar-friendliness. For example, Massachusetts receives the best score, while Oklahoma receives the worst.

The outermost ring (closest to each state label) shows the overall grades awarded the states. The inner rings represent factors contributing to the grades.



Toggle Colorblind Mode

New Jersey

2020 SOLAR REPORT CARD

Overall Grade: A

Policy

- A RPS Law
- A Carve Out/SRECs
- B Cost of Electricity
- A Net Metering

Incentives

- C Solar Rebates
- F State Solar Tax Credits
- A Sales Tax Exemption
- A Property Tax Exemption

B Interconnection C Low-Income Programs

Avg. Payback: 8 Years **IRR:** 14.7%

New Jersey

3rd place

Trend: ▼ **-1**

New Jersey slips just a little, and the future looks bright as the state's new transition SREC program remains one of the nation's best solar incentives for homeowners. The New Jersey board of public utilities also just approved landmark funding for dozens of community solar projects for low income households to make solar much more accessible.

Executive Summary

Our 2020 State Solar Power Rankings are better than ever before, and more accurately rank states that offer both long-term support for distributed solar and excellent financial rewards to solar owners. On the whole, the rankings show that the best states have remained resolutely atop the rankings, while raising the bar for what it means to support home solar.

The nationwide picture as a whole remains relatively unchanged between 2019 and 2020, with natural declines in installed prices being somewhat offset by the step-down of the federal solar investment tax credit. The average simple payback time increased by only a fraction of a few months, and investment return saw a similarly small decrease.

Re-jiggering our rankings factors

This year, we made changes to our ranking criteria and factor weighting. Net metering and high electricity prices gained importance, while some less-used incentives have decreased in importance. We also added two ranking factors: insolation, to account for natural reasons solar makes sense, and low-income solar programs, to reward states that have taken thoughtful steps to address the ability of solar to help low- and fixed-income homeowners who can most benefit from energy cost reduction, but who are often least-able to pay up front.

We think the effect of the rankings changes has caused this report to more accurately reward states where homeowners can expect to reap rewards from solar power long into the future.

Looking back at 2019

2019 was another exciting year in solar policy, with some surprising victories even considering a stagnant national policy picture for the industry.

Millions and millions of solar fans

The biggest news of the year may be that the U.S. hit 2 million solar installations as of May 2019, and is now well on its way to 3 million. California all by itself has more than a million installations, and its new home solar mandate will continue the trend of the state being a leader in solar.

Net metering

2019 saw wins for net metering in such strange places as Georgia, Maine, Washington, Idaho, and Montana. Those are states where net metering was either preserved or reinstated, despite the best efforts of utility companies who submitted rate cases that included demand charges and reduced compensation for net excess generation.

We also suffered some losses in 2019, in Louisiana and Kentucky, which finally killed net metering for good, and Arkansas, which opened the door to the end. We'll have to see if

regulators will walk through, perhaps led by fossil fuel executives riding on their backs and dangling carrots in their faces.

Low-income programs

In 2019, we took our first crack at exploring and grading low-income solar programs in the United States. We partnered with policy analyst Shawn Campbell to review existing programs and recommend our ideal low-income solar program.

These programs have added an additional facet to our review of state solar policy, and allowed states with smart programs to benefit in these rankings. Far more importantly, low-income solar programs expand access to people who might otherwise be left out of the clean energy revolution and bring the power of the sun to bear in solving issues like generational poverty and economic justice.

Batteries, batteries, batteries

The majority of homeowners are now interested in adding batteries with their solar installation… it's just that the marketplace hasn't quite caught up with them yet. As of the beginning of 2020, adding batteries to a solar installation is not yet an economically smart choice, pretty much anywhere, but that doesn't mean it's not a smart choice in general.

Perhaps the biggest catalyst of interest in batteries this year was how California utility company Pacific Gas and Electric (PG&E) began arbitrarily shutting the power off to thousands of people at a time. The shut-offs were necessary to mitigate fire risk, but that doesn't mean they were well-received. PGE&E's customers were understandably angry as heck about having their power shut off while also facing the prospects of wild fires in their area.

We spent some time on the floor at Solar Power International in 2019, where we noted that almost every major solar installer and manufacturer was now offering energy storage as part of their suite of home solar options. Expect that trend to continue into 2020.

This innovation will surely bring with it lower prices and increased options, with a possible side of technological breakthroughs. Hopefully the recently-announced Energy Storage Grand Challenge will spur some of that innovation.

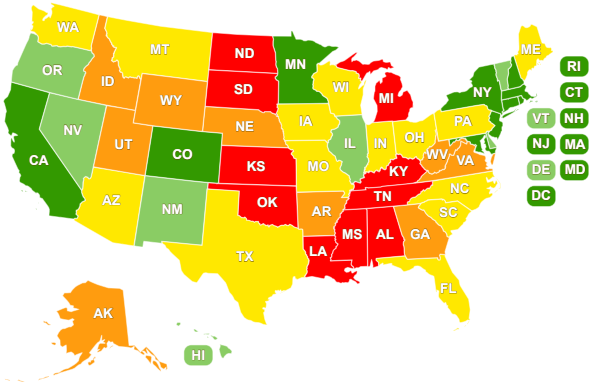
Looking ahead to 2020 and beyond

When it comes to looking at where the solar power industry is heading, it's by turns exciting and frustrating to be living in these times. It's exciting because after the growing pains of the 2000s and early 2010s, the solar industry has now arrived on the national and international stage as a major force.

It's frustrating because the solar industry could be growing so much more quickly—and prices would be so much lower—with some solid political leadership behind it. The industry is still hamstrung by a patchwork of state laws and Public Service Commission rules, many of which are written by former employees of utility and fossil fuel companies that stand to lose revenue if homeowners choose to replace the outdated central business model of burning stuff in one location and sending the electricity produced out across the land.

Barring some immediate national change like a nationwide Renewable Portfolio Standard, net metering rules, or federal direct grants, the industry and solar advocates will have to continue on as we have, fighting small battles in state houses and PUCs, while continuing to focus on streamlining the installation process, from finding customers, to filling out government forms, to getting panels attached to a roof.

2020 Solar Power State Grades Map



Here's a look at some of the fights and opportunities we see in the coming year:

Net Metering battles in 2020

Back in 2017, California introduced a net metering successor program now referred to as "Net Metering 2.0." The state of New York will be the next place to watch for such a successor program, as it seeks to transition folks from vanilla net metering to something called the "Value of Distributed Energy Resources Value Stack," or just VDER for short.

The New York Public Utilities Commission has spent years studying net metering, and is

designing the VDER program to recognize the “cost-shift” that solar customers cause to be foisted upon non-solar customers.

The current VDER picture looks like New York thinks solar owners are getting between 3.5 and 8.1 cents too much for every kilowatt-hour their panels produce but they don’t use. The state asserts the shortfall should be recouped to the tune of $227-$524 in extra fees or reduced compensation for solar owners. We know any argument we have to the contrary will fall on deaf ears, but we truly hope that New York can turn VDER into something simple for homeowners to understand and easy to work into everyday life.

In other news, Michigan may be the next place to reinstate net metering after it was lost, with bills introduced into the state legislature last year that may get full hearings this year. We’d be happy to see Michigan’s government re-join the ranks of sane policymakers, and we’ll update this page if and when it happens.

Solar tariffs in 2020

Donald Trump’s solar tariffs will step down to 20% on February 7, 2020, and are up for interim review at that time. The International Trade Commission is preparing its report on the effects of the tariffs, which is also due to be delivered to the President on February 7th.

The step down trajectory of the tariffs will likely not be affected by the ITC’s report, and they will again decrease in 2021, to 15%, before disappearing for good on February 7th, 2022.

It’s important to note that while the tariffs increase the average cost to install solar, the effect they have on residential installed prices is something like 5% over what they non-tariff price would be.

Unfortunately, the tariffs are still around while the federal solar tax credit steps down.

The Federal Solar Tax Credit Step-Down

Well, it happened, even though we hoped against hope that it wouldn’t. As of January 1st, 2020, the federal solar tax credit will cover 26% of the cost to install solar, down from 30% during the decade before.

Unless congress acts to preserve or reinstate the federal tax credit at its current of former level, it will step down again, to 22% for installations placed into service after 12/31/2020.

In 2019, we wrote that 4% of the solar tax credit was responsible for about $1,000 in savings, and the next step down will be responsible for another $1,000. Based on our current calculations, the change in the solar tax credit will cost Americans who go solar in 2020 an average of $1,200 and result in a drop of 0.8% in the internal rate of return on their solar investment.

investment.

Factors and Methods

For 2020, we analyzed 714 different data points to produce our final rankings. It wasn't easy, but it was worth it. Take a look at the factors we rated and the weights we assigned to each:

Click on the buttons below to see more information about the three different categories (policy, incentives, and outcomes), or the the twelve different factors. Each factor has its own ranking so you can see, for example, which state has the best solar carve-out, or which has the highest

energy prices.

Policy

RPS

RPS Solar Carve-Out/SRECs

Electricity Prices

Net Metering

Interconnection Standards

Incentives

Tax Credits

Rebates

Property Tax Exemptions

Sales Tax Exemptions

Low-Income Programs

Natural Factors

Insolation

Solar Policy Factors – 65%

Solar policy is the mix of laws and rules that govern whether and how you can get your home solar system hooked into the grid. It includes goals set at the state level for adoption of renewable energy, as well as rules that tell the utility company how much they have to pay you for the electricity produced by your panels. Some of these laws and rules make incentives available to solar owners to reward them for helping meet statewide goals.

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All told, the 5 policy factors make up 65% of our weighting system. Good solar policy is like the bedrock of the future energy landscape—with a strong bunch of laws and regulations in place, you can be sure a state will be favorable for solar long into the future. Without good policy, a state can still have a favorable climate (no pun intended) for owners of solar systems to make money, but without laws protecting that climate, there is sometimes no way to tell how long the good times will last, and it's easy for nefarious actors to make changes.

Of course, there's also a danger that state laws can be repealed as control of the legislature changes from one party to another, but changing a law is much more difficult than ending a program that's not mandated by the government to continue. To be fair to all states, we judge solar policy by what the leaders of the past and present have done to encourage renewable development, and leave it at that.

back to factor table

Renewable Portfolio Standards (RPS)

2019 was a good year for state Renewable Portfolio Standards, with significant new 100% renewable requirements coming out of California, Colorado, and Maine. We're awaiting a 2020 RPS decision in Arizona, where contentious solar vs. utility industry disputes have spilled over from net metering into enacting a new RPS law.

back to factor table

RPS Solar Carve-Out & SRECs or Performance Payments

Solar carve-outs and performance payment programs are two sides of the same coin, representing a policy/incentive hyrbid. Essentially, they say “some percentage of energy generated in the state must come from solar by a certain date, and there’s a penalty for not meeting that goal.” The penalty part means utilities are looking to either build their own solar generation facilities or prove that some of the energy they’ve bought and sold comes from solar.

That’s where Solar Renewable Energy Credits (SRECs) come in. As proof of generation, SRECs can be purchased by utilities to meet the carve-out goal, and their value is tied to (and always less than) the penalty for noncompliance.

You *can* have a solar carve out without performance payments (and states like North Carolina and New Hampshire do), but mostly people have realized the need for both. There’s also one case of a performance payment in a state without a solar-specific carve-out, too: Rhode Island.

Current carve-out highlights

Massachusetts’ Renewable Target (SMART) Program continues to be the progressive standard for all states looking to expand solar to honor. That program provides payments which increase as solar system sizes decrease to less than 25 kW. This ensures more participation in our clean energy future from small scale sources, like rooftop solar. The incentive is available now, so Massachusetts homeowners: walk don’t run to the nearest solar quote request form and get the ball rolling on your savings today!

Down below we say rebates are the best solar incentives, but darn if SRECs and other kinds of Solar Performance Payments aren’t trying their hardest to win this battle! SREC programs in places like New Jersey and Washington D.C. have been WILDLY successful in building the kind of solar landscape necessary for projects both huge and tiny to thrive.

For 2020, look for performance payment programs in New Jersey, Rhode Island and Massachusetts to keep going strong.

back to factor table

Electricity Prices

How can we guarantee that solar will be a success in a state? Electricity prices are the number 1 factor. In states like New York and Massachusetts, electricity prices are so high that solar is a no-brainer, just because it starts saving you money on day 1.

Electricity prices in most states rose about a penny this year. That's about a 4.4% increase, and it puts us back on trend after last year's 0.87% increase. We use an estimate of 3.5% increase per year for electricity prices, based on historical data.

We draw data for our estimates from the U.S. Energy Information Administration, which publishes monthly recaps of the total energy picture in the country. At the time we pulled the data for this report, 24 states had seen increases in their electricity prices averaging $0.01/kWh. Conversely, only 2 states saw their electricity prices decrease this year: Michigan and West Virginia.

back to factor table

Net Metering & Feed-in tariff

Net metering ensures you get credited the same amount you pay for electricity for the amount of power you send back into the grid when you aren't using all the power your panels produce, say in the middle of the day when your home may be empty. With utility companies in multiple states seeking to weaken standards and the clear linkage between retail rate credits and strong solar markets, it was time to boost this criteria score.

The net metering crisis that could've happened over the past few years has been relatively muted, thanks to the tireless work of certain committed solar advocacy groups. That said, states like Michigan, Kentucky, and Kansas have demolished their net metering rules and opened the door to all kinds of shenanigans from utility companies—demand charges, avoided cost feed-in tariffs, and "buy-all, sell-all" billing arrangements that eliminate almost all the financial benefit from solar panels.

For 2021 and beyond, we're hopeful for a future with nationwide net metering standards straight from FERC or some other regulatory body. For now, we keep fighting the good fight on a state-by-state basis.

back to factor table

Interconnection Standards

Interconnection policies and the streamlining thereof have been targeted by many in the solar industry as a major focus for future cost reductions. One step along that path was taken in 2019 by Minnesota, which adopted the IEEE Standard 1547™-2018 into its statewide interconnection regulations. It's a step along the path of having clear, easy standards nationwide.

Thankfully, nobody's taking steps backward on interconnection. As solar becomes bigger business around the country, utility companies have ample reason to continue to make it easier to hook your panels to the grid.

back to factor table

Solar Incentive Factors – 20%

Incentives make up another 20% of our overall weighting system, reduced from 40% in the years before the recent criteria changes. Incentives are important, but because of overall low prices, they're not as vital to the financial success of home solar as they once were.

Incentives are generally temporary monetary tools that help defray the cost of going solar and encourage people to consider solar power over other investments. Incentives are sometimes immediate, as is the case with most rebate programs. Other times, incentives are ongoing, and take the form of SREC markets tied to RPS goals, or tax credits that carry over for a number of years.

Generally, good incentives follow from good policy, but that's not always the case. A couple of the largest utility companies in Missouri, for example, offer good rebates without much of a state RPS to go on, while there are virtually no incentives in Maine, which has one of the most aggressive RPS laws in the country.

In any case, many of the most aggressive incentive programs have come and gone. And they've done a good job, too. Incentives are responsible for the health of the solar industry in places like Massachusetts, New Jersey, and Arizona, because they've served to increase competition in

the marketplace and drive costs down. But there are still some fine incentive programs to be found, in states as different as North Carolina, Wisconsin, and Texas. Here's what you've got to look forward to for incentives in 2020:

back to factor table

Tax Credits

State solar tax credits didn't change much in 2019, and it doesn't seem likely that they will in 2020, either. That said, the federal solar tax credit still exists, though is now reduced to 26% for anyone who installs solar before the end of 2020. After that, the tax credit will be reduced to 22% in 2021 until disappearing completely for residential installations as of January 1st, 2022.

There's an apt metaphor for this kind of slow decline of a wonderful, bright shiny thing, but we just can't quite come up with it.

back to factor table

Rebates

As incentives go, there aren't many better for solar owners than state solar rebates. Saving more money as soon as possible is always preferable to deferred payments or small credits over time. After all, a bird in the hand gets the early worm, right? Because of the fact that rebates apply to everyone who installs solar and not just those with enough income to nab a tax credit, we increased their importance in our 2020 rankings to 10% of the grade, from 5% in 2019.

The big rebate news for 2020 is that Duke's North Carolina solar rebates are still strong at $.60 per watt (though they've probably all been reserved by the time you read this), and Illinois is still offering pre-payment for SRECs which becomes a *de facto* rebate. Oregon has also got a new, small rebate program that should help out some low-income folks and offer cash to people outside the Portland metro who haven't been getting a lot of love in the past few years.

back to factor table

Property Tax Exemptions

Outside of Michigan successfully reinstating its property tax exemption, there have been no other changes in the country as we head into the next decade. There are 28 states with property tax exemptions earning less than an “A” grade. Ideally, we’d like to see everyone earn the highest possible grade, but we’ll start by wishing those 17 states without any property tax exemption get their acts together and pass something, stat. It’s the lowest hanging, easiest to pass pro-solar legislation.

May we suggest everyone adopts rules that ensure 100% of all newly-built homes come with solar, and also exempt those homes from additional property taxes as well?

back to factor table

Sales Tax Exemptions

In 2019, Washington reinstated its sales tax exemption. However, there are still 18 other states without any sales tax exemption for solar purchases, which we'd love to see fixed as quickly as possible.

back to factor table

Low-Income Solar Programs

This is sort of a hybrid category, because it can't exist without good policy, but the incentives in low-income solar programs are what make them work. After all, you can't convince an entire industry to act to benefit the poor and middle class out of the goodness of its heart.

Ideally, solar programs should open up access to a clean energy future to groups that may not otherwise have access to capital to install solar. They can include community solar installations, where each participant in the program owns a part of a larger solar installation miles away from where they live, yet they still receive credits for their power on their residential power bill through programs like virtual net metering.

In relation to other low income programs, solar loans can provide a more significant and longer term return on investment compared to grants. They also allow greater flexibility in household decision making and help low income households avoid third party ownership and other leasing agreements which can interfere with solar ownership.

back to factor table

Insolation – 10%

That's an "o," not a "u." We're not talking about pink fluffy stuff in your attic here, people. Insolation is a pretty straightforward measurement of how much solar energy strikes the surface of the earth at any given place.

The National Renewable Energy Laboratory maintains several datasets that track average daily and annual insolation for every 4-kilometer² chunk of the country. We use an average for a state as a whole, but in realilty, how much sun you get depends on a lot of factors. Thankfully, there are home solar calculators out there that take into account your exact location and can even model the effects of roof pitch, direction, and shade from trees and other obstructions to give you a highly-accurate picture of how much energy you can generate with solar on your roof. It's pretty cool!

back to factor table

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