BILL'S HOME TECH

Home & Small Business Tech Solutions

An Extended Guide · No. 1528

Roof Direction and Tilt

Which way your roof faces, and why it matters

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! Read this first — this is professional, on-the-roof work

Putting solar on a roof is expert, permitted work — not a weekend project. It means drilling into your roof and sealing every hole against water for decades, or setting heavy ballast your roof has to carry, all while working at a height where a fall can be deadly and around wiring that is live whenever the sun is up. This guide is here to help you understand and judge that work — so you can hire the right people and ask good questions — not to walk you up a ladder to do it yourself. For any roof-mounted system, use a licensed, insured, properly credentialed solar installer, make sure the required permit and inspection actually happen, and protect your roof's warranty before the first hole is drilled. And please don't climb up to inspect or adjust anything yourself — the roof is their job, not yours. In this guide we're looking at which way your roof faces and how steep it is — because that quietly shapes how much sun your panels actually see, long before mounting hardware ever comes up.

Let's talk about which way your roof faces

Two things decide how well a spot on your roof works for solar before an installer ever picks up a wrench: which direction it faces, and what shades it. This guide covers both, in plain English.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. I help older adults and busy families make sense of home technology decisions without the sales pressure or the jargon. Direction and tilt are some of the first things a good installer evaluates, and they're worth understanding before you look at any proposal.

None of this requires math on your part. There are no degrees or percentages in this guide — just the plain, general patterns that shape how a roof performs, so you can follow along with whatever an installer tells you.

★ You don't need to calculate anything

Your installer does the actual modeling for your roof. My job, and this guide's job, is just to help you understand it well enough to ask good questions. Call or text me anytime at (330) 200-8042.

The whole guide, on one page

If you remember only these things, you'll follow any installer's explanation of your roof with confidence.

- ❑ In our part of the world, a south-facing roof plane generally sees the most sun over the course of a year.
- ❑ East- and west-facing roofs still work well for solar, just with some loss compared to a south-facing plane.
- ❑ North-facing roof planes are the weakest choice and are usually avoided, or used only as a last resort.
- ❑ Your roof's own slope usually sets the panel's angle — panels typically mount flush and parallel to the roof.
- ❑ Tilt legs that angle panels away from the roof are mainly a flat-roof tool, not something added to an already-sloped roof.
- ❑ Shade from trees, chimneys, dormers, or a neighbor's house is one of the biggest threats to production, and your installer should account for it before you sign anything.

> **✔ Read it in any order**
> Skip to the section you're curious about — the direction table, the shade section, or the common questions at the end. You won't miss anything you need.

Why which way your roof faces matters so much

It comes down to a simple idea: a roof plane that spends more of the day looking toward the sun generally does better.

In our hemisphere, the sun tracks across the southern part of the sky through most of the day. A roof facing that direction spends more of the day in direct sun than a roof facing another way — which is the whole reason direction gets so much attention.

That doesn't mean other directions are unusable. It means direction is one of the first, biggest factors an installer weighs when they look at your roof and suggest where panels should go.

Keep this in plain terms as you read the rest of this guide: some directions are meaningfully stronger, some come with a little give-back, and one is generally best avoided. No numbers required to follow along.

> **✔ One honest mental model**
> Picture the sun's path arcing across the southern sky during the day. Whichever roof plane spends the most time facing that arc is generally your strongest one.

South, east/west, and north — the plain differences

Four directions, three honest categories. Here's the plain version of each.

South-facing

Generally the strongest choice in our hemisphere. A south-facing roof plane tends to see the most sun across a typical year, which is why installers usually look here first.

East- and west-facing

Still solid choices, just with some loss compared to south. An east-facing plane catches more morning sun; a west-facing plane catches more afternoon sun. Either can work well on its own or alongside another roof face.

North-facing

The weakest of the four. A north-facing roof plane is usually avoided for solar, or used only when there's genuinely no better option on the property.

> **! Don't let a quote gloss over direction**
> An installer who doesn't discuss which roof face they're proposing, and why, is skipping something important. A good one will walk you through it plainly.

Your roof's slope usually decides the tilt

On most sloped roofs, there's no separate angle to pick — your roof already picked it.

- **Panels mount flush.** Most roof-mounted panels sit parallel to the roof surface, following your roof's existing pitch.
- **Your roof's slope is, in effect, the panel's angle.** There's usually no separate tilt decision to make on a sloped roof.
- **Tilt legs are the exception, not the rule.** Hardware that angles panels up away from the roof is mostly a flat-roof or low-slope tool.
- **A steeper or shallower roof gives you a steeper or shallower array.** One more reason your roof is what it is going in.

> **★ A question worth asking**
> "Will the panels sit flush with my roof, or will there be tilt hardware involved?" A good installer will answer plainly and explain why. Happy to help you make sense of the answer — (330) 200-8042.

Why installers work with your roof's angle, not against it

Mounting flush isn't just simpler — it's usually the sturdier, more proven choice too.

Mounting panels flush against the roof keeps the racking low-profile and reduces how much wind can get underneath and around the array. It also keeps the system simpler, with fewer extra parts to install and maintain.

Changing a panel's angle away from the roof's own slope adds hardware and changes how the array handles wind — which is exactly why tilt legs are mostly reserved for flat roofs, where there's no existing slope to work with in the first place.

> **! Judging your roof's pitch is not a homeowner task**
> Please don't climb up to eyeball your own roof's steepness or layout. Your installer measures this safely, using plans, ground-based tools, or a careful, insured visit — never something for you to check yourself.

The single biggest threat to production: shade

You can have a perfect south-facing roof and still lose real production to shadows most people never think to count.

Trees are the most common culprit, and the trickiest — shade from a tree moves across your roof through the day and changes with the seasons as leaves come and go. A tree that looks harmless in July can throw a very different shadow in another season.

Chimneys, dormers, roof vents, and even a neighbor's house or tree can all throw shade too. Some of these are fixed and easy to spot; others move with the sun and are easy to underestimate.

None of this means shade rules out solar. It means an honest, season-by-season survey of what shades your roof is one of the most important things an installer should do before proposing a layout.

> **✔ Small shadows add up over a year**
> Even partial shade on part of an array, at certain times of day, can matter more than people expect. It's worth asking your installer how they accounted for it.

How an installer figures out what your roof will actually do

This part is the installer's job, not yours — but it's worth knowing it should happen at all.

A good installer uses modeling tools that reference your roof's actual direction, tilt, and shading to estimate what your specific array will produce, before you ever sign a contract. This is why a proposal should be tied to your roof, not a generic example from a brochure.

You don't need to understand the modeling itself. You just need to know it should exist, be based on your roof, and be something the installer is willing to walk you through in plain language.

> **! Be wary of a quote that skips this step**
> A generic, one-size-fits-all production estimate that ignores your roof's actual direction and shading is a red flag. Ask to see something specific to your home.

Sometimes one roof face isn't the whole answer

Using more than one roof plane for a single system is more common than people expect.

When one roof face is partly shaded, too small, or an odd shape, installers commonly split an array across two or more roof faces instead of forcing everything onto one plane. It's a normal engineering choice, not a sign of a compromised design.

A split array does mean more wiring runs and more attachment areas to plan for, but a good installer weighs that against the alternative — cramming everything onto one shaded or awkward plane — and lets the modeling guide the decision.

> **✔ There's no shame in a split roof**
> If your installer proposes using two roof faces instead of one, that's usually a sign they're optimizing for your actual roof, not taking a shortcut.

Two kinds of homes, two sets of needs

Direction and shade play out differently depending on your lot, your neighbors, and how many roofs you have to choose from.

If you live in town or the suburbs

In town and the suburbs, lots tend to be smaller and closer together, which means shade from a neighbor's tree or a neighbor's house is a bigger factor than most people expect — and it can change as trees grow over the years.

- A compact lot often means fewer roof faces to choose from, so getting an honest shade survey matters even more.
- A neighbor's mature tree, even one you don't own, can shade part of your roof for part of the day.
- An HOA may have a say in which roof face panels can go on, worth checking before you settle on a layout.
- Roof shape — additions, dormers, hips — often creates more usable faces than the one you'd notice first.

If you are out in the country on a well

Out in the country, you often have more roof planes to choose from — the house, plus a barn, a pole building, or a shop — and usually less shading from close neighbors. A big, open, well-facing roof can be an excellent home for an array.

- A large, unshaded barn or pole-building roof facing a strong direction can outperform a smaller, partly shaded house roof.
- Fewer nearby structures usually means less shade to survey, though distant tree lines still deserve a look.
- If your water comes from a well, getting the strongest possible roof face right matters more for reliable production.
- Choosing between the house and an outbuilding can come down to direction and shade as much as convenience.

> **★ Not sure which roof face is your best bet?**
> Comparing a house roof against a barn or outbuilding roof is one of the most common questions I get from rural families. Tell me what you've got and we'll think it through. Call (330) 200-8042.

Most roofs have more than one usable face

The roof plane you'd point to first isn't always the one an installer ends up recommending.

Hips, additions, dormers, and simple roof shape all create more than one plane to consider. A thorough installer surveys all of them — not just the biggest or most visible one from the street.

Sometimes the "obvious" face, like the one you see from the driveway, isn't actually the best producer once direction and shade are weighed honestly. That's exactly why the modeling step matters.

> **★ Walk your roof with me, mentally**
> Tell me how your roof is shaped and what's around it — trees, neighbors, outbuildings — and I'm glad to help you think through which faces are worth asking an installer about. (330) 200-8042.

When tilt legs do come into play

Flat and low-slope roofs are the one place this guide's "your roof sets the tilt" rule doesn't quite apply.

A flat or low-slope roof has no real pitch to follow, so installers may add tilt legs — hardware that angles the panels up toward the sun instead of leaving them lying flat. That changes wind exposure and spacing considerations in ways a sloped-roof install doesn't have to deal with.

On a sloped roof, by contrast, tilt legs are rarely needed at all — the roof itself is already doing that job. If you have both a sloped house roof and a flat outbuilding roof, expect this conversation to look different for each one.

> **✔ See our flat-roof guide**
> Our guide on solar for flat and low-slope roofs covers the tilt-leg and ballast side of this question in more depth.

A few general patterns, at a glance

A short summary of everything above, worth bookmarking.

Factor	General pattern
Roof direction	South is strongest; east/west work with some loss; north is weakest.
Roof pitch	Usually sets the panel's angle directly — no separate tilt on sloped roofs.
Flat roofs	May use tilt legs to angle panels — see our flat-roof guide.
Shade	The biggest single threat to production, worth surveying honestly, season by season.

✔ Your installer's modeling is the real answer

This table is a general pattern, not a substitute for your installer's actual modeling of your specific roof.

Direction and tilt don't stand alone

Whichever roof face and tilt end up in a proposal, other requirements still apply on top of them.

Before direction and shade even come up, it's worth asking whether your roof is a good candidate for solar in the first place — our guide on evaluating your roof as a solar candidate covers sun, space, shade, age, and structure together.

And whichever face and tilt get used, the mount still has to meet local engineering requirements for wind and snow. Our guide on snow and wind load in Ohio covers how attachment spacing gets engineered for our weather, regardless of which way the roof faces.

> **! A great-facing roof still needs to meet code**
> A strong south-facing roof plane doesn't skip the permit, structural, or engineering requirements. Direction affects production, not whether the mount has to be done right.

What a thoughtful direction-and-tilt conversation looks like

A good installer walks you through a handful of things before you ever see a final proposal.

- **Which roof face or faces they're proposing, and why.** Tied to your actual roof, not a generic layout.
- **A production estimate based on your roof.** Not a brochure example from someone else's house.
- **An honest survey of shade sources.** Including ones that change with the seasons, not just what's obvious today.
- **Whether a split array makes sense.** If one face alone isn't the strongest option.
- **How any flat-roof tilt hardware affects wind exposure.** If tilt legs are part of the plan.

> **★ Bring me the proposal**
> If an installer's explanation of direction and shade leaves you unsure, I'm glad to help you make sense of it — honestly, with no stake in the sale. (330) 200-8042.

Where this fits in the permit and paperwork process

The direction-and-tilt decision isn't just a conversation — it usually ends up on paper too.

Production modeling and the roof-face layout are often part of what an installer submits with permit paperwork. Ask to see the plan that matches what will actually go on your roof, not just a verbal description.

An installer who's unwilling to show you their modeling or the layout plan is telling you something important. This is exactly the kind of paperwork a licensed, insured installer should be glad to share.

> **! No plan to show you is a flag**
> If a proposal can't be tied to an actual plan for your roof, treat that as a reason to ask more questions before you sign anything.

More roof faces can mean more penetrations to track

Using multiple roof planes, or a less common face, can mean attachments in more places — worth keeping in mind for your roof's warranty.

Splitting an array across faces, or mounting on a face that's less standard for your roof type, doesn't change the fundamentals: every attachment point still needs proper flashing, and every attachment still deserves the same careful workmanship.

Whichever roof faces end up hosting panels, protecting your roof's warranty comes down to the same things — a licensed, insured installer, quality flashing at every attachment, and a workmanship warranty in writing before the first hole is drilled.

> **★ Ask before, not after**
> Whatever layout you're considering, getting the warranty question answered in writing up front is worth the five minutes it takes. (330) 200-8042.

What good looks like, from the ground

You'll never inspect the roof yourself, but a few honest signs of a careful direction-and-tilt job are visible from below.

- **A layout that matches the proposal.** Panels on the faces you were shown, not a surprise change on install day.
- **Even spacing and alignment.** Tidy rows suggest a carefully planned layout underneath.
- **No obvious untrimmed branches hanging over the array.** A sign shading was actually considered.
- **Consistent panels across split faces, if used.** A cohesive look even when more than one roof plane is involved.
- **Paperwork that matches what's on the roof.** The permit plan and the finished install should tell the same story.

> **✔ Trust your eyes, then trust the paper**
> From the ground, a tidy, matching layout is a good sign. The modeling and permit paperwork are the proof that the direction and tilt decisions were made carefully.

Questions worth asking an installer

You don't need technical answers — you need a clear, specific explanation tied to your own roof.

Q: Which roof face or faces are you proposing, and why?
A good installer names the face, ties it to your roof's shape and shading, and explains their reasoning in plain terms.

Q: Can you show me a production estimate based on my actual roof?
You want modeling tied to your home, not a generic example from a brochure or another customer's roof.

Q: What shade sources did you account for, including ones that change with the seasons?
Listen for mention of trees, neighboring structures, and anything else nearby — not just what's obvious on a sunny afternoon.

Q: Would splitting the array across more than one roof face make sense here?
A thoughtful answer explains why one face was chosen over another, or why splitting the array was or wasn't the right call.

> **★ Bring the answers to me**
> If an installer's explanation leaves you unsure, that's a fine reason to call. I'll help you make sense of what you heard, honestly and with no stake in the sale. (330) 200-8042.

Common Questions

The questions about roof direction and tilt I hear most often, answered plainly.

Q: Is my roof unusable for solar if it doesn't face south?
No. East- and west-facing roofs still work well, just with some loss compared to south. North-facing planes are the weakest option but aren't automatically ruled out either.

Q: Can I choose to tilt my panels differently than my roof's slope?
On a sloped roof, panels almost always mount flush with the roof's own angle. Separate tilt hardware is mainly a flat-roof tool, not something typically added to a sloped roof.

Q: Does a little shade really make a difference?
Often more than people expect, especially shade that shifts with the seasons. It's worth an honest, season-by-season survey rather than a glance on one sunny day.

Q: What if my best roof face is on the barn, not the house?
That's common on rural properties. A big, unshaded outbuilding roof facing a strong direction can outperform a smaller, partly shaded house roof.

Q: Can trees be trimmed instead of avoiding that roof face entirely?
Sometimes. Trimming overhanging branches can help, though a mature tree's overall shade pattern is worth discussing honestly with your installer before you count on it.

> **★ Still have a question I didn't cover?**
> That's what I'm here for. Call or text me at (330) 200-8042 and ask — there's no such thing as a silly question about your own home.

Bringing it all together

Direction, tilt, and shade quietly shape how well solar works on your particular roof — and now you know the plain-English version of all three.

South-facing roof planes generally do best, east and west still work well with some loss, and north is the weakest choice. Your roof's own slope usually sets the panel's tilt, with tilt legs reserved mostly for flat roofs. And shade, more than almost anything else, is worth an honest, season-by-season look.

None of this is something you need to calculate yourself. It's context for understanding your installer's modeling and asking good questions — while the licensed, insured professionals handle the roof, the permits, and the wiring.

> **★ Let's look at your roof together**
> Whether you're just curious or comparing proposals, I'm glad to be your patient, plain-spoken second opinion — no sales pressure, ever. Call or text (330) 200-8042.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made understanding your roof's direction and tilt feel a little less daunting and a lot more doable. Keep it in a drawer with your other home papers, come back to a page whenever you need it, and don't worry about memorizing anything.

When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat $99, and for the parts that don't need me on-site I can often help right on your screen for $49. Every visit comes with a 30-day, come-back-free guarantee. I don't climb on roofs or do the licensed solar, roofing, or electrical work myself — for that I'll help you line up a trustworthy, properly credentialed local pro.

> **★ Bill's Home Tech — real help, close to home**
> Call or text me at (330) 200-8042, or visit BillsHomeTech.com. Serving Atwater and all of Portage County. 30+ years of patient, plain-English tech help — and if you're ever not 100% happy with a visit, I'll make it right or refund it. That's a promise. — Bill

Which Way Is Your Roof Facing?

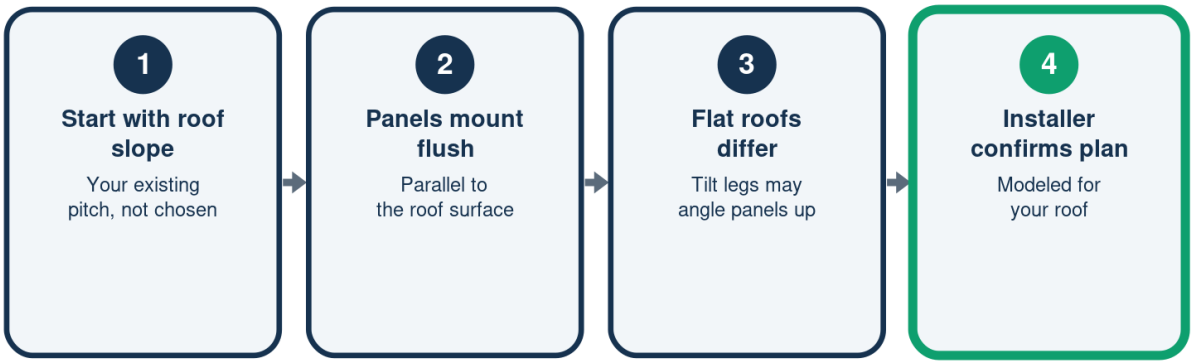
A general pattern for our hemisphere

	General strength
South-facing	Strongest choice
East / west-facing	Solid, some loss
North-facing	Generally weakest

Your installer models your actual roof -- this is the general pattern.

How Your Roof Becomes an Array's Angle

From roof slope to a modeled plan



On most sloped roofs, the roof's own angle is the panel's angle.

What Threatens Production Most

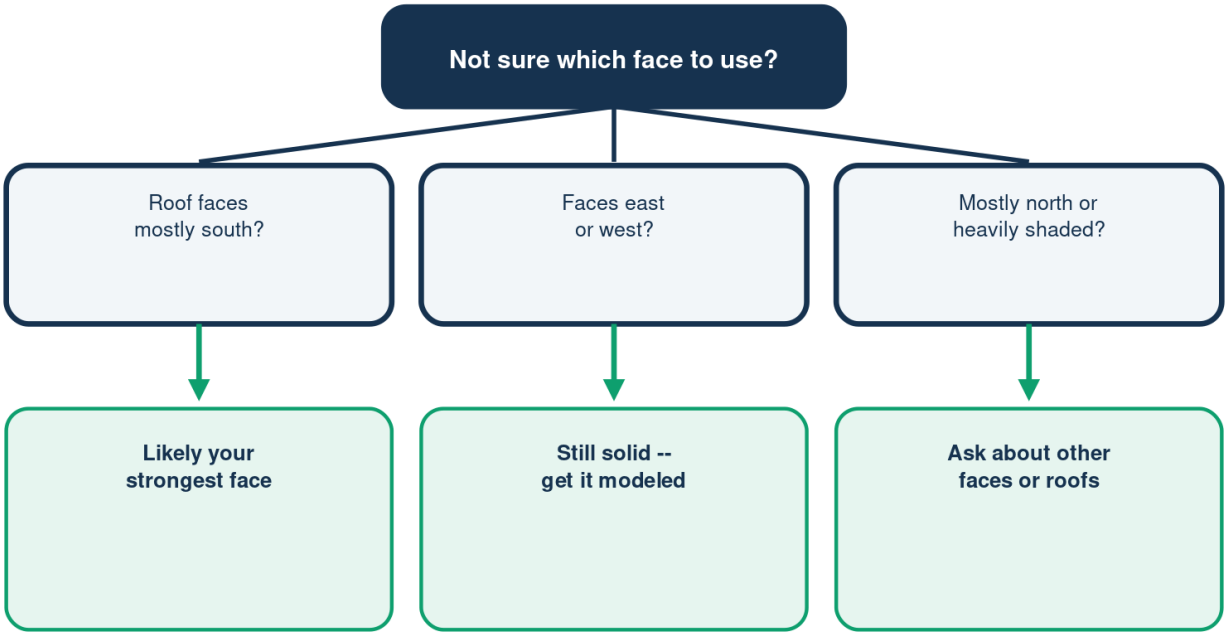
Shade sources worth an honest look

	Watch for
Trees	Shifts with seasons
Chimneys, dormers	Fixed shadows
Neighboring homes	Not in your control

Even partial shade is worth surveying honestly, face by face.

Is Your Roof Facing the Right Way?

Three honest checks before you commit



Let the installer's modeling decide, not a guess from the yard.

Illustration - a schematic, not to scale. Your setup may differ.

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A Note From Bill

A quick note from Bill.

I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that comes from using these guides. Thanks for reading, and stay safe out there.

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