Grants

The European Union is eager to promote the use of renewable energies and so reduce our reliance on fossil fuels. As a result, there are a variety of grants and financial support packages available to those who choose renewable energy. It is important to recognise that grants are only offered to those systems recognised by the EU for their superior quality.

All new builds and renovations throughout Spain are required under legislation to incorporate solar hot water. We are happy to discuss the various options with you, and if you do decide to invest in a Solar in Spain renewable energy system, we will arrange all the necessary paperwork.

Factor 1: Your Monthly and Yearly Power Bill

This is the first thing you should look at. It forms the basis for your solar energy production goals.

For instance, if your monthly bill is 50€ (600€ for the year), then you probably don't need a solar array that produces 1000€ worth of energy.

Step 1: Go look at your bills – summer and winter – and see how much you've been paying.

Then, if you have them, go look at your rates from some years ago. One client we looked at is getting charged **more than twice as much** for energy in 2019 as he was in 2009, and he's using about the same amount of energy.

Your solar panels will produce consistent power for over 20 years. Factoring in this kind of inflation should be part of your consideration. Your cost savings from solar will increase as time passes, even if your usage doesn't change.

Factor 2: Your Monthly and Yearly Power Usage

There's the cost, and then there's the usage. Your usage is listed in kilowatt-hours – or kWh. Look it up on your power bill.

Usage is separate from the cost for the reason given above. Your usage may not change much for ten years, but the cost will change. This matters because solar panels produce a certain amount of kWh, and that amount won't change much.

You need to think about how your life circumstances might change in ways that increase or decrease your energy usage.

Will you be having kids? They'll require more energy.

Are you planning to add in a hot tub?

Do you want a new home entertainment system?

A second fridge?

Big computer hardware upgrades or additions?

Or an electric car?

These sorts of things will add significant kWh to your monthly usage. So if you know already you've got a couple big powere users in your sights, factor those in to your future energy needs.

Step 2: Think about how your future energy needs will change in 10-20 years.

If you're averaging 800 kWh a month now, maybe it will go up to 1000. Or if you're planning to move to a larger home and want to put solar panels on it, that larger home will probably require more energy usage. Plan accordingly

Step 3: Set a solar power production goal.

How much of your energy do you want to produce from solar? 80%? 50%? As much as you can afford? All of it?

You want to know this, because that's ultimately what determines how many solar panels you'll end up needing. And knowing your kWh usage is the key. If you use 1500 kWh per month, and want to produce 80% of that from solar panels, you'll need a system that generates 1200 kWh per month.

Factor 3: Inconsistent Power Production

July isn't December. While we can disagree about which month is our "favorite," we can't disagree about which one is better for solar energy production in the northern hemisphere

Which months are best for solar varies by region.

- What happens if your system produces excess energy in summer months? Where will the excess go?
- Does your utility have a net-metering (solar buyback) program?
- Do you have a way to store the extra energy (lithium-ion storage solutions)?

If you don't want to buy battery storage, and if you can't sell it back to the grid because your utility doesn't allow it, then producing more energy than you need does you no good.

That's why many people set a goal less than 100%. If your goal is to produce 70% of your energy needs from solar, then it's unlikely you'll generate more than you need, even in the summer. And instead of having a zero power bill, you'll just have a much smaller one.

But just be aware – your solar panels will not produce consistent amounts of energy around the year.

Step 4: Re-consider your goal with excess energy in mind

Factor 4: Your Daily Power Usage – kWh Per Day

Yes, we're back to your power bill again. But we're also getting closer to the number you want to know – how many solar panels will you need.

Step 5: Divide monthly power usage by 30 days.

Look at your bill again. If you're using 1000 kWh per month, that's 33 kWh per day. You'll want this number to help determine how many solar panels you'll need.

Factor 5: Average Daily "Direct" Sunlight

This is a big one. The same sized solar array in Sweden will produce far less energy than one in Mallorca. The reason is because they don't get as much direct sunlight – and not just because of cloud cover. They are also at a different position on the earth, meaning the angle of the sunlight hitting Sweden is smaller than what hits Spain.

What is "direct sunlight?" It's sunlight that hits a certain spot without interference or obstruction

Sunshine & Daylight Hours in Palma De Mallorca, Majorca, Spain

- On balance hours of sunshine in Palma De Mallorca, Majorca range from 4:32 for every day in December to 11:27 each day in July
- The longest day of the year is 14:47 long and the shortest day is 9:12 long.
- The longest day is 5:35 longer than the shortest day.
- There is an average of 2796 hours of sunlight per year (of a possible 4383) with an average of 7:39 of sunlight per day.
- It is sunny 63.8% of daylight hours. The remaining 36.2% of daylight hours are likely cloudy or with shade, haze or low sun intensity.
- At midday the sun is on average 50.8° above the horizon at Palma De Mallorca, Majorca.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Sunlight Hours/ Day	04:56	06:09	06:34	07:38	09:32	10:20	11:27	10:42	07:58	06:17	05:36	04:32	07:39
Average Daylight Hours & Minutes/ Day	09:42	10:38	11:52	13:12	14:19	14:54	14:38	13:40	12:23	11:04	09:57	09:24	12:00
Sunny & (Cloudy) Daylight Hours (%)	52 (48)	59 (41)	56 (44)	58 (42)	67 (33)	70 (30)	79 (21)	79 (21)	65 (35)	58 (42)	57 (43)	49 (51)	64 (36)
Sun altitude at solar noon on the 21st day (°).	30.6	39.9	50.7	62.4	70.7	73.9	70.8	62.5	51	39.6	30.4	27	50.8

And now, you're ready!

Step 6: Calculate your solar panel system size. (Here's the math!)

You've already got the information you need to do this if you did the first 5 tasks. Here's a simple equation to use.

kWh per month / (avg sunlight per day * 30) = kW solar system

For example, if you're using 1000 kWh per month and average 5.5 hours of sunlight per day, that would be 1000 divided by 5.5 * 30, or 1000 / 165 = 6.06 kW

So, to provide 1000 kWh per month in a place that gets 5.5 hours of direct sunlight per day would require a 6.06 kW solar energy system.

For comparison, to produce that much energy in a place with only 3 hours of sunlight per day would require an 11.1 kW solar system – almost twice as big.

To understand what this means, a "6 kW system" means a solar array that produces 6 kWh for **every hour of direct sunlight**. So a 6 kW system, in a location with 5.5 hours of direct sunlight, makes 33 kWh per day. Remember Factor #4? If your kWh per day is less than this number, then you know your system will cover all your energy needs, on average.

You Are Now Empowered

Now, you have some actual information, and you can use this to get quotes from solar panel installers like us. They can quote you on a 6 kW solar array, for example.

But wait, there's one more factor to consider. And that factor will be a huge one in their quote.

Remember, the question is *how many* solar panels will you need, not just how large a system. Your roof can only handle so many panels, right? (Yes, your roof size is a 7th factor, but that one's kind of obvious. Unless you're doing a ground installation, you will need the square footage for your roof).

Factor 6: Solar Panel Wattage – Actual Power Production PER PANEL

Different panels produce different amounts of power. And this is why answering the question of how many solar panels a particular house, business, or farm will need can't be answered for everyone all at once.

Solar panels on the market today range from 45 Watts to 315 Watts. That number is the amount of power that a specific panel produces. So, to power the same 6 kW system, you'd need a lot more 45-W panels than you would 315-W panels. Get the idea?

When you go solar panel shopping, you want to already know the size of system you want, using the process we've given here. Because then you can say to the installer, ***"Give me quotes for an X-kW sized solar array."***

Step 7: Get a solar quote for your ideal system size.

If you have a small roof, you'll probably want higher-wattage panels because you don't have the space for tons of them. But, higher-wattage panels cost more. However, you'll need fewer of them than you would less productive panels.

"So how many solar panels will I need?!!?"

Step 8: Find the number of panels **for the wattage you're considering**.

Take your system size number (the one you just calculated, in kW), and follow this simple process:

- Multiply it by 1000 (because there are 1000 Watts in 1 kW)
- Decide the wattage of the solar panels you are considering buying
- **Divide #1 by #2**

Our example continues: A 6 kW system is a 6000 W system. If I want to buy 300-W solar panels, then 6000 / 300 = 20 solar panels. So to install a 6 kW solar array, which will produce 1000 kWh per month in 5.5 hours of direct sunlight, will require me to buy twenty 300 Watt solar panels.

If you don't want to buy 300 Watt panels, then recalculate using 250 Watts, or 200 Watts. 6000 divided by 200 equals 30 panels.

Here again is your 8-step process for determining how many solar panels you'll need to make the energy you want.

Step 1: Go look at your bills – summer and winter – and see how much you've been paying.

Step 2: Think about how your future energy needs will change in 10-20 years.

Step 3: Set a solar power production goal.

Step 4: Re-consider your goal with excess energy in mind

Step 5: Divide monthly power usage by 30 days.

Step 6: Calculate your solar panel system size. (Here's the math!)

Step 7: Get a solar quote for your ideal system size.

Step 8: Find the number of panels for the wattage you're considering.