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Sunshine electricity: photovoltaics FAQs



by [Liz Ayling](#)

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Photovoltaic panels to generate solar energy are mushrooming on our roofs. Alongside the army of cell phone masts, satellite dishes and solar water heaters. There are [government support schemes](#) to encourage us to install. But before we speak to the salesmen, and there are around 30 plus firms in the sector here now, what do we need to know?

Charles Yousif of the Institute of Sustainable Energy at the University of Malta and also Secretary General of the Malta Energy Efficiency & Renewable Energies Association, answers FAQs on the whole photovoltaic trend. Charles entitled his answers: 'Photovoltaics:

Today's Energy Choice for Future Energy Savings' as while you won't have a totally zero electricity bill with photovoltaics, you won't be at the mercy, as much, of price hikes in fossil fuel produced electricity. Essential reading for homeowners thinking green.



Barcelona Port Forum's giant solar plant. The city has the highest density of solar panels in Europe. The shape of things to come in Malta?

Q. Malta is experiencing an exponential growth in photovoltaic installations, especially in the domestic sector. Why?

Up to a few years back, Malta had very few photovoltaic installations. The first installation ever was built for demonstration purposes and tested at the Institute for Sustainable Energy (ex-Energy Technology) of the University of Malta, back in 1993, when grid-connection of such systems was actually illegal. Up to 2005, very few systems were installed and the price per kW_{peak} installed was equivalent to €16,000, making the technology economically unfeasible. Following Government capital grants as of 2006 and more aggressively as of 2008, the number of installations has increased and today we have about 5 MW_p registered with the MRA. One would estimate that these installations are now producing 7.5 GWh of electrical energy per year, saving around 6,585 tonnes of carbon dioxide. The electricity generated from these systems is about 0.35% of what Enemalta Corporation had generated in 2010.

Q. Do you mean that if there are no grants, the installations would drop in number?

According to the European Renewable Energy Directive, Malta has to reach 10% renewable energy share by 2020. Malta has already committed itself to that and is now putting measures to reach the target, by taking it one step at a time. The first intermediate trajectory target of 2% has to be reached by 2012. There are many different ways of incentivising potential clients to install solar photovoltaic systems. One of them is the capital grants that Government has implemented so far. But, one also notes that this year the feed-in tariff has also been introduced. A feed-in tariff implies that a customer could opt to sell the solar generated electricity to the grid and get a financial credit for it. The majority of EU Member States use feed-in tariff schemes. Given that most of the capital grants that were given to PV installations were from European funds, one would presume that Malta will shift to a 100% feed-in tariff scheme, when these funds are exhausted. Hence, in essence people will install only if they see a financial benefit to their investment. On the other hand, I presume that by 2015, the prices of photovoltaic electricity will be cheaper than fossil-fuelled electricity in an island scenario such as Malta, to the extent that there will be no need for grants or subsidies to encourage investment in this field.

Q. How should one go about finding a PV system?

As it stands today, many customers go and get quotations from different suppliers, choose the cheapest and apply for the maximum grant of €3,000. This is absolutely wrong because the available roof area may not be large enough to accommodate all the panels that you need. The approach should be to evaluate the potentially un-shaded area on the roof first. Then, get quotes.

Q. How do you do that?

First, any shading or partial shading on the panels would deem the PV system almost redundant. Panels are usually connected in series so that

if one or more of them are partially shaded, the output is drastically reduced. In order to calculate the potential un-shaded area, you need to take note of all obstacles such as the boundary wall. For every 1 metre high of obstacle one has to move away 2.4 metres in all directions. This value ensures that the panels will not be shaded during the winter months when the sun is low in the sky. Once this is made, the total remaining un-shaded area may be determined. For example, a 100 m² roof with boundary walls would probably reduce to around 50m² of un-shaded space. One has to remember that rows of panels should also be spaced out to avoid cross-shading. Hence, in order to calculate the approximate capacity of this particular example, one would take the un-shaded area and divide it by 14, to get the kilo-watt peak (kWp) of the system (assumed to be of crystalline silicon cell panels, installed facing south and inclined at 30° to the horizontal). Hence for this example, the un-shaded area can host around 3.5 kWp.

Q. Do you mean that one would only save 3.5 units of electricity from this system that is occupying 50 m²?

No, tests carried out in Malta showed that every 1 kWp of photovoltaic system would produce a long-term average of 1,460 kWh/year. Hence a 3.5 kWp would produce 5,110 units of electricity per year or a daily average of 14 units. The long-term result also caters for the fact that solar systems degrade in performance by about 1% per year.

Q. It seems quite attractive to save 15 units per day, which is the average consumption of a family in Malta. Would you recommend all families to consider installing such a system?

Before one can recommend a photovoltaic system, it is very important that the family installs a [solar heating system](#). Solar heaters are 3 times more efficient and 5 times cheaper than photovoltaics and also occupy much less space. Government is also giving grants for installing them in 2011. In Greece, no grants are given to a photovoltaic system unless the dwelling already has a solar heater and this makes a lot of sense,

because solar electricity should only be used with efficient appliances or with services that cannot do otherwise, such as a fridges, tv sets, lights, computers, etc... Water heating is best achieved by a solar heater and not by producing expensive solar electricity and wasting it in an electric boiler (geezer).

Q. Will my electricity bill be near zero if I have the optimum photovoltaic system in place?

Let's not give the impression that what matters is ONLY the bill, because even if the bill is zero, you still have to fork out the rent of the meter.

It is impossible to claim or give guarantees that a combination of a solar water heater and the right number of PV panels will bring the bill down to zero, because the panels do not produce the same amount of energy everyday due to the seasonal and daily variations of the sun's energy. In Malta, we are no longer talking about net metering (although it is still possible to opt for that). We are now talking about feed-in tariff, which implies that you sell what is generated and buy from Enemalta what you need. So really you are still buying from Enemalta all the same

It also does not make sense to produce more than you consume, because there is an upper limit beyond which Enemalta will buy the electricity at a much lower price.

Q. Is it true that photovoltaic systems have no maintenance requirements?

Photovoltaic systems have constituent parts: first, the solar panels which are guaranteed for at least 20 years; and second, an inverter which is the heart of the system. It converts dc power to ac power. Inverters can have a guarantee of 10 years, extendable to 20 years at a premium. Then there is the support structure for the solar panels, the cabling, the circuit breakers and other components. If one ensures that all these components are of good quality and are installed properly from the start, then there should be no major problem for maintenance. Washing of the

modules after a sandy rain or during summer, could improve performance but such an activity should not be carried out during bright sunshine hours. One also has to be very careful and use insulating material such as wood handles when washing the panels and this should never be done barefooted. Photovoltaic systems are electrically active even if one switches off the mains supply. Their output is high dc voltage which is very dangerous, in case of electrocuting. No tampering with the panels or the inverter should be allowed and the roof must be made inaccessible to children.

Q. How do you see the future of photovoltaics in Malta?

It can only move forwards but it requires a stable market environment, which can only be achieved if a long-term support scheme is put in place, to allow a sustainable and competitive development of the local market. I am worried a little bit by the fact that there is no local expertise in repairing inverters and normally no stock is kept in store. Hence, when an inverter fails, one would have to wait for weeks until it is sent abroad for repair or replaced by a new one under guarantee. In any case, the customer would be losing days if not months until the system is put on line again. I also see Malta as a potential hub for the Mediterranean and North African region. There is a niche market to provide expertise and support services in this field to larger markets in the region.

Photo: Courtesy [Carlos Lorenzo](#)

More on Barcelona's solar use

Barcelona & Solar Energy: for more on the city's impressive promotion and use of solar energy, [click here](#).

Further Information

The [Institute for Sustainable Energies](#) offers a technical inspection of installed, domestic, solar water heaters and photovoltaic systems. For an appointment, call Eur. Ing. Charles Yousif on 2165 0675. See the Institute's site for details too.

[Malta Resources Authority \(MRA\)](#) operates government's support schemes including subsidies for first-time installation of domestic solar water heaters and for photovoltaic panels.

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About Liz Ayling

Liz Ayling is a serial blogger, feature writer and self-taught geek who has been an expat in Malta for over 20 years. She founded destination site Malta InsideOut in 2009. You'll find her at at her screen in an old village farmhouse which she shares with her Maltese husband, teenage son and two cats. Liz considers herself an insider nowadays but never ceases to be surprised by all that Malta has to offer.

Comments

Rudy Burow

Well said, but people need to understand that adding Solar to their property is an asset that could improve the future valuation of their home if / when they choose to sell. With the environment the way it is going we are unable to underestimate any product or service that provides zero cost energy at no cost to both the customer and more notably the earth!

🕒 FEBRUARY 14, 2013 AT 01:51

abela anthony

Very enlightening. UOM should prepare students of elec.engineering to repair/construct inverters as a future technical requirement. Plasma cutters using inverters(much lighter version than the transformer types) also might come into this. I believe that I will have a hard time fixing mine when it goes bust. Any comments will be appreciated. Tony

🕒 JUNE 27, 2011 AT 07:53

Arthur Gera

Up to recently the roof of my house was exposed to sunlight throught the day summer and winter.A block of flats has since been built on the east side with the result that the roof is now shaded up to 11.30 hrs in summer and later in winter. It is therefore not practical for me to install photovoltaic system. Can I be compensated for this loss of sunshine by having a right to attach my panels on the side walls of the adjoining block of flats.

🕒 JUNE 27, 2011 AT 07:41

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