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1.Now we would discuss about the different solar panels:

Polycrystalline Silicon Solar Cells- The first solar panels based on polycrystalline silicon, which also is known as polysilicon (p-Si) and multi-crystalline silicon (mc-Si). These were introduced in the market in the year 1981. It is not like monocrystalline-based solar panels, it is something that is not in requirement of Czochralski process. Here raw silicon is being melted and poured into a square mold. This is cooled and cut perfectly in square wafers.

Advantages of this approach-

- The process of making is much easy. The amount of wasted silicon is quite less.
- They have slightly lower heat tolerance, in technical terms it performs slightly worse than that of monocrystalline solar panels in high temperatures.. However this effect is not much.

Disadvantages of these approaches-

- The efficiency of polycrystalline-based solar panels is typically 13-16%. It is because it has lower silicon purity.
- The space efficiency is quite low. You generally need to cover larger surface

String Ribbon Solar Cells- These are also being made from polycrystalline silicon. String Ribbon is the name of a manufacturing technology that has the tenacity of producing some form of polycrystalline silicon. The temperature resistant wires are being pulled through molten silicon. This results in thin silicon ribbons. The solar panels made with this technology looks familiar to traditional polycrystalline solar panels.

Evergreen Solar was the main manufacturer of solar panels using the String Ribbon technology. The company is now defunct due to bankruptcy.

Advantages of this approach-

- They only use half the amount of silicon.

Disadvantages of this particular approach-

- They are more energy extensive and more costly.
- According to research the efficiency of these solar panels have frequently dropped down.
- Low space efficiency of the main type of crystalline-based solar panels

Thin-Film Solar Cells (TFSC)- Deposition of one or several thin layers of photovoltaic material onto a substrate is the basic idea on how thin-film solar cells are being manufactured. They are also known as being defined as thin-film photovoltaic cells (TFPV). The different types of thin-film solar cells can be classified by which photovoltaic material is put down onto the substrate.

The photovoltaic material is deposited onto the substrate:

- *Amorphous silicon (a-Si)*
- *Cadmium telluride (CdTe)*
- *Copper indium gallium selenide (CIS/CIGS)*
- *Organic photovoltaic cells (OPC)*

As days went by these thin-films module prototypes have reached the level of efficiency between 7–13% and production modules operate at about 9%. Further the efficiency is about to climb up to 10–16%.

The market for thin-film PV rose at a 60% annual rate from 2002 to 2007. In 2011, it was about 5% of U.S. photovoltaic module shipments to the residential sector were based on the thin films.

Advantages of this particular approach-

- Mass production is quite simple. It makes them quite modest to manufacture than crystalline-based solar cells.
- It makes them look more attractive.
- It is quite flexible.
- High temperatures and shading does have less impact
- If space is not really an issue it can work wonders

Disadvantages of this particular approach-

- Not quite useful in residential purpose.
- Requires lot of space
- Low space-efficiency also means that the costs of PV-equipment will rise up.
- It has the tendency to degrade

Amorphous Silicon (a-Si) Solar Cells- As the output of electrical power is low, solar cells based on amorphous silicon have traditionally only been used for small -scale applications. As for instance, in case of pocket calculations it is being used in tandem. However current innovations have made them more appealing even for large scale applications. With a manufacturing technique called “stacking”, several layers of amorphous silicon solar cells can be conglomerated. This results in higher efficiency. Only 1% of the silicon used in crystalline silicon solar cells is required in amorphous silicon solar cells.

Cadmium Telluride (CdTe) Solar Cells- It is only thin film solar panels that have surpassed the cost efficiency of crystalline silicon solar panels in a significant portion in the market. The efficiency is such that it can operate at a rate which ranges from 9-11%. First Solar has installed over 5 gig watts

(GW) of cadmium telluride thin-film solar panels worldwide. The same company holds the world record for CdTe PV module efficiency of 14.4%

Copper Indium Gallium Selenide (CIS/CIGS) Solar Cells- Compared to the other thin-film technologies above, CIGS solar cells have showed the most potential in terms of efficiency. These solar cells contain less amounts of the toxic material cadmium that is found in CdTe solar cells.

Commercial production of flexible CIGS solar panels was started in Germany in 2011.As compared to other thin-film technologies, CIGS solar cells have been one of the most potential in terms of energy. They contain less toxic materials. It is to be noted that CdTe solar cells. Commercial production of flexible CIGS solar panels was started in Germany in 2011. Many of the thin film solar cell types are still in the state of research. Some does have enormous potentials.

Building-Integrated Photovoltaic's (BIPV)- Building integrated photovoltaics have several subtypes, which can be based on both crystalline-based and thin-film solar cells. It is used in façade, roofs and windows, walls and so on. But it is quite expensive. If you are having extra money and is in want to integrate photovoltaics in the entire home, you should look for building integrated photovoltaics.

2. Advantages and disadvantages of different solar panel types:

Best solar panel type for home use: First you need to call up an expert who would help you out in deciding which solar panel you need to choose for your household. Some of the scenarios are as follows:

Limited Space-Those individuals who are not having enough space for thin solar panels crystalline-based solar panels are your best choice for you.

- There are array of choices which includes the ranks of the 180, 200 and 220-watt rated solar panels are usually physically the same size.
- They are made exactly the same way, but they generally but under- or over perform when tested.
- Both mono- and polycrystalline solar panels are good choices and offer similar advantages.
- You must know that Monocrystalline solar panels are slightly more exclusive.
- If you had one polycrystalline and one monocrystalline solar panel, both being rated by 220-watt, they would generate the same amount of electricity, but monocrystalline silicon will take less space.
- If you are in favor of low cost per rated power, pay as little as possible for certain amount of electricity.
- You should also investigate if the film solar panels could in fact be much better than that of mono- or polycrystalline solar panels.

Pros & Cons of Solar Energy

Below you`ll find a list over the various pros and cons of solar energy. By clicking on one of the blue links, you will be taken further down on the page for more in-depth information. Everything you are about to read is properly referenced at the bottom.

Pros

1. *Renewable*
2. *Abundant*
3. *Sustainable*
4. *Environmentally Friendly*
5. *Good Availability*
6. *Reduces Electricity Costs*
7. *Many Applications*
8. *Shared Solar*
9. *Silent*

10. *Financial Support from Government/State*
11. *Low Maintenance*
12. *Technology is Improving*

Cons

1. *Expensive*
2. *Intermittent*
3. *Energy Storage is Expensive*
4. *Associated with Pollution*
5. *Exotic Materials*
6. *Requires Space*

Advantages of Solar Energy

Renewable- Solar energy is renewable- It means that there would be no such shortage of solar as opposed to non-renewable energy sources. According to NASA "We will have access to solar energy for as long as the sun is alive – another 6.5 billion years"

Abundant-The earth surface receives 120,000 terawatts of solar radiation (sunlight) – 20,000 times more power than what is needed to supply for the entire world.

Sustainable- **An abundant and renewable energy source is also sustainable-** A sustainable energy source meets the needs and demands without even compromising the ability of future generation. It is sustainable as there is no such way we can over consume it.

Environmentally Friendly- Solar energy does not cause any harm to the environment. Though there are emission from transportation and installation of solar power system. Solar energy decreases our dependence on non-renewable energy sources. This is an important step in fighting the climate crisis.

Good Availability- It is available all over the world. It is found not only in countries close to the equator but it is also being available by countries away from the equator. Germany has the highest capacity of solar power in the entire world.

It decreases cost of electricity- With the introduction of net metering and feed-in tariff (FIT) schemes, homeowners can now sell of the existing electricity. At the same time one can receive credit during time as they produce more electricity on what they are actually consuming.

In simpler terms homeowners can decrease overall electricity expenses. Statistics from One Block Off the Grid reveals that adding solar panels to your home can bring in monthly savings of well above $100 in many states. In Hawaii, residents save on average $64,000 after couple of decades. The chance of homeowners choosing leasing or power purchase agreements to finance their solar panels decreases the costs.

Solar power can be used in varied application- Solar energy can be used in generation of electricity in places that lacks grid connection, for distilling water in Africa, or even to power satellites in space. With the introduction of thin fill solar cells, the solar power can be seemingly integrated into the material of the building.

Shared solar- Because of shading and insufficient space and ownership issues, 1/5 homes in the US are simply not being fitted for usage of solar panels. Through this approach homeowners can subscribe to "community solar gardens" and generate electricity without even having solar panels.

It is silent- There are no moving parts involved in almost all application of solar power. No such noise is being generated. It is much more favorable than the green techs like wind turbines.

Financial support and stability from the government- Government of all countries have supported this particular approach. This means the prices of the solar panels are much less. In some cases, the price of a residential photovoltaic system can be under 50%. As of 12/31/2008, the U.S. government offers a 30% tax credit with no upper limit. Chances are your home is also eligible for other grants and rebates.

Low cost of maintenance- The solar power does not require much of maintenance. It requires cleaning for couple of times. It can last up to near about three decades.

Technology is improving rapidly- Technological advancement is being made constantly in order to meet up the standards. Innovation in nanotechnology and quantum physics has the tenacity to multiply the output three times more.

Disadvantages of Solar Energy

It is quite expensive- Is solar energy expensive is a debatable question. The driving forces behind the development of solar energy are rooted in politics. Solar power is motivated to compete against other energy sources on the market. On the other hand, the U.S. government, like that of the rest of the world, provides incentives to every major energy production market – not just solar. In 2010, coal received $1,189 billion in federal subsidies and support for electricity production while solar is not far behind at $968 billion.

Solar energy is an intermittent energy source- **Access to sunlight is not much. It is quite a difficulty during the over cast days.** However, solar power has few obstacles than wind power when it comes to intermittence.

Energy storage is expensive- Energy storage space systems such as batteries will help smooth out demand and weight, making solar power more stable, but these technologies are also expensive.

Exotic materials- Certain solar cells requires materials that are quite expensive and are rare in nature. This is especially true for thin-film solar cells

Requires more space- Power density, or watt per square meter (W/m^2), while looking at how much power can be derived from a specified area of real estate of an energy source. Low power density indicates that too much real estate is required to provide the power we demand at an effective price.

3.Net Metering Program

Net Metering is yet another type of renewable energy protocol in the location of Ontario that helps the customers in decreasing their hydro bills, through the export of generated electricity back to the utility grid. It is being done for the credit energy that is being consumed. Listed below are the approaches of how it works:

Solar Net Metering Program explained below

<h1 class="message">An error occurred.</h1> Try watching this video on www.youtube.com, or enable JavaScript if it is disabled in your browser.

It is to be noted that the commercial Net Metering carries out its approaches the very same way as a residential program operates. The approach allows the commercial entities towards installing solar panels on the rooftop of their production facilities. At the same time the panels are being installed right at the office, warehouse, and industrial shops. It helps in generating electricity through on site purpose for their house.

Commercial Solar Net Metering System

Any surplus electricity is being sent in a direct manner to the grid. Here the customers are only being charged for the difference between their total energy production and consumption that is being carried out over the course of the billing period. If in any given month the output of energy is greater than the consumption, a KWH credit is being created and is carried out over for up to 12 months until the process expires.

Who is eligible to participate in the Net Metering program?

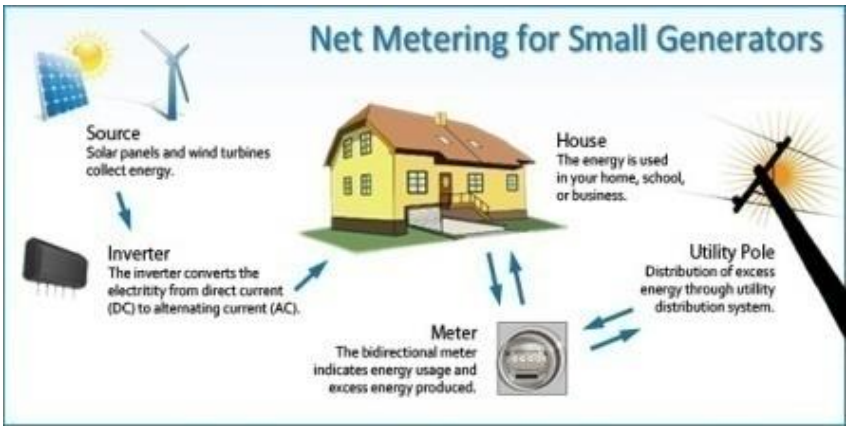
Listed below are the criteria that are to be kept in mind for participating in Net Monitoring Program:

- If you are planning to generate electricity primarily for self use.
- If you are using renewable solar energy like that off solar wind and hydro.
- Maximum size of the system is less than 500 KW
- The electricity that is being generated is being covered to the consumption point without any such hold hydro company's distribution category.

How will it be calculated on my hydro bill?

The total value of the amount of eligible electricity being generated and then returned into a local utility company's grid will be deducted from the value of the amount of electricity that you consumed from the particular system.

If the desired result is positive, you would be receiving an alteration on result your monthly (or bi-monthly) hydro bill. But if the result is a negative you will be receiving a credit that will be carried over into your next billing period. The excess energy credit from previous billing cycle can be carried over up to a maximum of twelve months.



How to apply for the Net Metering program?

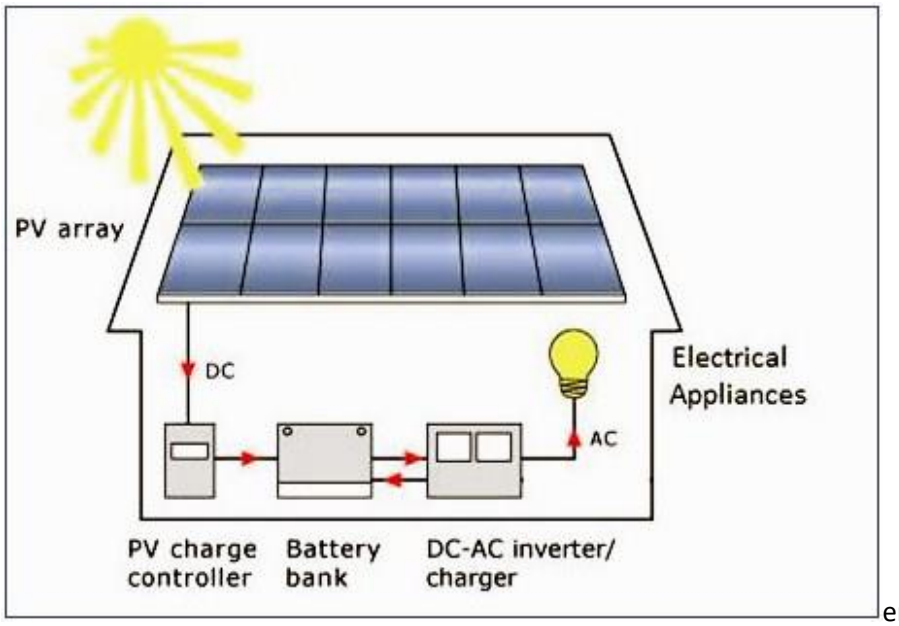
In order to find out what exactly is being required in order to participate in Net Metering program and then connect the system to the grid, as professionals we strongly recommend and encourage you towards contacting the local solar panel installer. The qualified electrical contractor would be able to consult you on the solar panels. The sizes along with the costs are to be taken into consideration. The required documentation and approvals are to be submitted to the authorities.

Click here to get you connected to your local solar panels installer, and get multiple quotes for FREE within 24 hours!

Solar Net Metering Calculator

You can easily calculate your Net-Metering benefits on your website.

Going off Grid: Off Grid Solar System- It is to be noted that an off grid solar system is nothing, but one of the pivotal approaches, which carries, out its mode of operation through solar photovoltaic system. At the same time it operates in an autonomous manner. If you own a cottage or if you are living in a remote area with no electric poles around it, then installing an off grid system is the only way out of bringing pow



er.

Typical Off Grid System Components:

A stand-alone solar panel system usually consists of the following:

- Solar panel arrays
- PV charge controller
- Charging Voltage
- Battery Bank
- Inverter
- Loads

Click here to get you connected to your local solar panels installer, and get multiple quotes for FREE within 24 hours!

4.What you need to ask the concerned installer

Though we are pre-qualified solar panel organization, it is quiet important for you to get accustomed with each of the installer all by yourself. A particular organization will be carrying out a valued research on the particular site assessment and shading analysis. It would be providing you with a particular solar modules layout and quote and financial analysis of the solar investment.

Listed below are few questions that you need to be asking:

- Do you have professional and experienced installing solar panel system in Ontario? What is the number of system you have installed in Ontario?
- Can you provide a list of past customers who would be willing to provide reference?
- Are the particular installers qualified to install the project? Are they potent enough in meeting all the safety standards? Do they meet the licensing and certification parameters?

- Is the business being registered with Better Business Bureau?
- Do you have any such warranties on the particular product?
- Do you have any such general liabilities towards covering the property damage or injury?
- Do you have any pending or active legal judgment against the company
- Will you be assessing my property in order to ensure that the particular system is being installed at any given location? As for instances, will you ensure that the particular solar panel system is not a shaded location.
- Will you be ordering all the required equipments for this project? What is the entire cost of the total installation?
- Are there any such fees that are not being included on the quote?
- What are the ongoing operations and maintenance cost that I can expect and who are the persons who will be responsible for them?
- Are there any such free quotes included?
- Will be arranging all the necessary approvals and permits? This usually includes
-

  (a) Building Permit(s)
  (b) Offer to Connect from the Local Distribution Company (LDC)
  (c) Authorization to Connect from the Electrical Safety Authority (ESA)
  (d) Renewable Energy Approval, if required

- Will you be working with the local Distribution Company to arrange for connection to the grid? This includes the following:
  - preparing the connection configuration diagrams
  - arranging for payment of the connection costs
  - helping prepare the connection agreement with the local distribution company
  - Arranging for installation and testing of the meter.
- Will you be helping me towards preparation of my microFIT Program application

Next steps

Now you know what to inquire from a solar panel company. To get in touch with leading solar panel installers in Ontario, fill out the request for quotes and proposals.

5.Micro FIT program

The location of Ontario is a buzzing lucrative financial incentive for solar energy called Feed-In-Tariff program or FIT/micro FIT. If you have planned to install solar panels in your roof or piece of land, you can surely earn extra income and allow several individual to live in a sustainable ambience. Click on the link below and watch the video to find out how it works: *Source: Ontario*

Power authority- If you are a homeowner or a farmer or a small business owner, you will be having the opportunity towards development of small and micro renewable electricity generation project (10 kilowatts or less in size) on your property. The micro FIT Program will be including the following:

- You will be paid a fixed price for all the electricity your project produces for at least couple of decades.
- You will be helped towards replacement of coal fired generation across the entire province and decrease greenhouse gases and other such pollutants.
- You will be helping to create new local business and green jobs in the location of Ontario.

How much will the solar system costs? In order to find out how much solar panel generally costs what you need to do is submit an online application and then you can receive permits and approvals. Just simply fill out a Request Form in less than a minute. We would be more than happy to provide you a three minutes quote from professional solar panel installers.

***Updates of micro FIT*:**

January 10, 2017 New Year, new rates, new microFIT version 4.1

On January 4, 2017 the IESO started accepting new applications for microFIT program version 4.1. If you are planning to submit yours through the online portal, please make sure you are using the latest versions of the prescribed forms, otherwise it will be rejected. Once again, here's a look at the new 2017 microFIT rates:

On January the 4th, 2017 the IESO commenced to accept latest application from microFIT program version 4.1. If you are planning to submit your application through the online pedestal, all you need to make sure is use the latest version of the prescribed forms. If it is being not done so, it will be rejected. Once gain you can have a look at the latest 2017 microFIT rates.

FIT/microFIT PRICE SCHEDULE (January 1, 2017)

Renewable Fuel	Project Size Tranche*	Price (¢/kWh)	Percentage Escalated**
Solar (PV) (Rooftop)	≤ 6 kW	31.1	0%
	> 6 kW ≤ 10 kW	28.8	0%
	> 10 kW ≤ 100 kW	22.3	0%
	> 100 kW ≤ 500 kW	20.7	0%
Solar (PV) (Non-Rooftop)	≤ 10 kW	21.0	0%
	> 10 kW ≤ 500 kW	19.2	0%

The microFIT procurement target for the year 2017 stays at 50 MW. Keep it in mind 2018 will be the last year of the government solar incentives under 50 MW. After this the solar Net Monitoring will become the primary source of installing that is being distributed for solar generation in Ontario.

December 12, 2016 microFIT solar version 4.1

On January 1st, 2017 new prices for residential microFIT solar panels projects will kick in. No other changes have been implemented at this time.

If you still have not received your microFIT Application Approval Notice from your local utility company, it is time that you speed up. All you need to do is call and ask them to report your offer in connecting to the solar panels to IESO no later than 12:00 PM on December 23rd. If it is not being done so the application will stand pending. It will be subjected to microFIT version 4.1 and 2017 FIT/microFIT pricing schedule.

November 11, 2016 Applications for FIT projects are now being accepted:

The procurement target for the commercial solar FIT 5 program is only 150MW. So if you are looking ahead towards installing a miniature FIT project, now is really a good time towards submitting your application to the IESO. The window closes on November 25, 2016 at 12PM. If you miss it, the one and only other available option would be commercial solar Net Metering.

Please read carefully and review the updated version of the program and documents and rules. You would also be required towards delivering a hard copy of application materials along with payments to the IESO's office within five business days after the submission of the electronic Application Form. It is to be noted that the applications cannot be revised after they have been submitted. Please make sure your request is complete and accurate before you submit i.

Contact us for further details!

November 9, 2016 Updates on microFIT application process

The current application procedure time is approximately couple of months. This is due to the current back-log. It is bit more complicated and time consuming. It is aimed at protecting the consumers. So you need to be ware. There were few organizations that were filling up the application on your behalf. They would receive an application from the government and show that you are completely approved.

This is the reason why IESO and your local utility are always after in making sure that you completely understand the entire approach. You also need to get the contact details and login id and password information to your microFIT home page to yourself

Even if it takes a little bit longer than anticipated, please do not give up. You are carrying out something, that is not only good for you but for your house and the entire environment. Indeed thanks for going solar.

September 1, 2016 New microFIT/FIT 5 rates

On August 31st 2016, the IESO (former OPA) posted the new microFIT and FIT rates effective January 1, 2017. This time, they have consulted with the public interest groups and received project cost and pricing data from external consultants. They have also gathered information from basic international reports and research materials. It was brought to the understanding that cot deductions for microFIT projects have not been as fast as for larger system sizes. The prices for microFIT projects remained almost and roughly the same

The comparison table is cited below:

2016 vs 2017 Price Comparison

Feed-in-Tariff Program Pricing (¢/kWh)			
	Project size	June 21, 2016 Current price	Jan. 1, 2017 Pricing
Solar PV Rooftop	≤ 6 kW	31.3	31.1
	> 6 kW ≤ 10 kW	29.4	28.8
	> 10 kW ≤ 100 kW	24.2	22.3
	> 100 kW ≤ 500 kW	22.5	20.7
Solar PV Non-Rooftop	≤ 10 kW	21.4	21
	> 10 kW ≤ 500 kW	20.9	19.2

If you really want to qualify for micro fit 5 rates, than your solar panel system would have to be completely installed no later than Mid-2018 or nearly in an about 2019

July 8, 2016 New applications are now being accepted under the new micro FIT 4.0- The IESO (former OPA) is readily planning to commence a process of review process of current micro Fit and FIT programs. This ensures that both the rate payers are valued and a reasonable return on investment is specified. If you are interested towards providing some valued feedback to the IESO relating to the current solar panels, you are welcomed to carry it out. You can drop mail at microfit@ieso.ca.

June 21, 2016 New applications are now being accepted under the new micro FIT 4.0- To be honest the micro FIT program is up and running again. The IESO has commenced to accept the latest application for solar panel installation under the latest micro FIT 4.0 rules. One of the

massive changes for the solar panel installation under latest micro FIT 4.0 rules is the introduction of the latest tranche, for solar panel project size.

It is to be noted that if you are planning to install 6.0 kW (or less) of solar panels on your roof, you would be getting highest price that is being available currently. It is time to call your solar panels installer and submit your application before 50 MW procurement target for 2016 runs out.

April 25, 2016 micro FIT program is suspended until July 2016.

Well, it took less than a few weeks to hear back from the IESO. Today they announced a temporary suspension of the micro FIT program. As stated “it has been initiated due to irregularities within the application process that suggest Applicants and third-party representatives are not following proper procedure when making legal declarations.”.

In order to address this IESO, will be making changes to the stipulated rules in order to include the requirements. This is being done towards having Applicant Declaration Prescribed Form be notarized before it is being submitted. This and some other changes are going to be discussed in details during Solar Ontario 2016 on May 16&17, 2016 in Niagara Falls.

The IESO is all ready to implement the revised micro FIT in July 2016. This is being done at which point the micro FIT program will again re-open in order to accept the latest applications. If you are planning to participate, we are here to encourage you towards choosing your solar panel installer and finalize your system design. After all the necessary work you need to begin working on the necessary submission package.

April 10, 2016 New micro FIT program rules, version 4.0 -

The IESO (former OPA) is currently working on the new micro FIT 4.0 rules, which are set to boot in mid-2016. Some of the major changes would include:

Introduction of the latest size tier for micro Fit projects that are 6W or smaller, if you want quality for the latest rate, you would have to wait and apply under micro Fit 4.0 rules. If you are still planning towards installing between 6kW and 10kW, you would be getting the same rate that is currently set up for 2016.

It will allow you to connect your micro FIT project in series with the meter. If your local distribution company generally approves your request for connect (from C)

In order to know more you need to understand micro FIT rules, and have Internet access to log-in into your micro FIT account

6.Five easy steps to get Solar Panels in Ontario

10kW micro FIT system, Parry Sound In operation since October 2010. - "The solar production continues to amaze me. I chose to sell the generated hydro back to the grid at .80 cents per kilowatt. The first three months have generated between $750 – $850 per month.

Expected pay back on the loan is around 6 1/2 to 7 years with the remaining income from the 20 year contract going to me. The layout covers my entire garage roof and has generated many second looks and inquiries. The sun is shining today and the panels are making money. To not make use of free clean energy seems like such a waste and I would encourage anyone interested to simply contact www.ontario-solar-installers.ca and ask about going solar. THAT'S HOW IT ALL STARTED FOR ME"- Lewis M., Parry Sound, ON.

10.78 kW microFIT system, Oakville, ON. In operation since Dec. 2011.- I am very glad I used www.ontario-solar-installers.ca to find my installer. Solar contractor performed an absolutely amazing install last Saturday. The workmanship is of the highest caliber, the panels are as straight as can be and the attachment method used to secure the rails to the roof is of the highest quality. The arrays are very neat and evenly spaced. It was quite an achievement when you consider that they all worked a 13-14 hour day with temperatures hitting 35 degrees and the humid exceeding hitting 45 degrees.

David N., Oakville, ON

6.86 kW microFIT system, Baden, ON. In operation since July 2012. - We have found our solar panel installer through www.ontario-solar-installers.ca website. Contractor did a great job with our solar panel sales and installation. Our many project questions were answered promptly and thoroughly. The installation was completed quickly and professionally. We have been earning the predicted amount so far with our 6.86kWh roof top mounted system. We highly recommend visiting www.ontario-solar-installers.ca website and obtaining several quotes before you install your solar project.

Sherilyn and Michael, Baden, ON

10.00 kW microFIT system, Oakville, ON. In operation since Sept. 2012. Now in the 4th year, solar income is in line to what was sold, so I am very satisfied. It feels good to know that I am doing my bit to green world, and at the same time, I will make investment return. Thank you, OSI team (ontario-solar-installers.ca) for recommending a reputable installer!

Antonio S, Oakville, ON.

5.4 kW microFIT system, Mississauga In operation since May 2013. "We were very interested in solar technology when we learned about Ontario's micro FIT Program. Installing solar panels was a high priority for us in order to contribute to the "Green" cause and helping the environment, while at the same time securing a stable return on investment. It has been one of the best investments for our house. We received a few quotes through www.ontario-solar-installers.ca website, and found a reputable solar contractor who provided exceptional knowledge and service from start to finish. Throughout the installation, we were pleased with their professionalism, experience and dedication to their work. Thank you for the excellent Solar PV System design, installation and service."

Arshad I., Mississauga, ON

10.0 kW micro FIT system, Mississauga In operation since April 2013-

Here are the pictures of the 10 kW system installed and also a snap shot of the energy production in the last 3 years. In terms of presentation my house is not situated ideally towards South. When the solar array was commissioned in May 15, 2013, the original calculations for energy generation were at 70% of the ideal forecasted values (when it's facing true south at a 33 deg. roof angle). Now take a look at the numbers from Tigo and the PDF file generated from the application PVWatts and do the comparison.

You will see that in 2014 it was 82.4% and in 2015 was 86.7% and finally this year I'm expecting 11 MWh production and that gives us 90.4%. These numbers are amazing! Thanks, guys, for beating my expectations!

Ahmed M., Mississauga, ON

10.0 kW microFIT system, Whitby In operation since April 2013. "It will be this biggest generating year so far – we have already surpassed last year – which was biggest. People ask me all the time: "Does it makes sense?" Well, my quick response is: "I would do it again – without any hesitation". In fact – I wish I would have done it earlier. It is extra income for those rainy days – It basically pays my taxes for me." ***Ron P., Whitby, ON***

9.8 kW microFIT system, Kitchener. In operation since July 2014.- Thanks to the efforts of OSI, I am now entering my fourth month of solar production. Solar panel installer I found was extremely helpful in completing the required paperwork, contracts and arranging the financing.

The engineer attended my site and evaluated the location and a proposed layout was provided and agreed upon. Installers showed up to mount the panels as scheduled and followed through on the project until the system was fully operational, A very professional and organized process that works extremely well.

Contact has continued to ensure the system is functioning as planned. Thank you www.ontario-solar-installers.ca team for helping me find a professional solar installation company. I would definitely recommend this web source for all your solar needs.

Nicoleta H., Kitchener, ON

10 kW microFIT system, Hamilton, ON. In operation since Jun. 2015 The best investment I've ever made! This will pay the tuition fees for my children once they start going off to university. I filled out a request form on www.ontario-solar-installers.ca website, and got estimates from 3 different companies. Went with the one that had more experience, i.e. more than 350 solar installations. They took care of everything from start to finish, and so far our system is running better than calculated. Below are our production numbers for 2015:

- June: 1,682.63kWh
- July: 1,767.27 kWh
- August: 1'463.22 kWh
- September: 1'238.26 kWh
- October: 795.83 kWh
- November: 798.13 kWh
- December: 512.68 kWh
- January 2016: 607.01 kWh

Andrew Z., Hamilton, ON

10.29 kW microFIT system, Woodbridge, ON. In operation since Dec. 2015.-

Purchasing and installing solar panels can seem intimidating, but with the right guidance and help it was simple and quick. I would recommend visiting www.ontario-solar-installers.ca website to anyone looking to install a solar power generating system.- *Steve V., Woodbridge, ON* -

7. Installation of solar panels racking system

Low maintenance cost- A professional would be charging you profit on the materials, but this does not mean you can get them at an affordable price. A professional would help you towards saving money on pallet, mounting clips by the case. You can spend hours running to the supply house for a connector that a professional carries on their relevant truck.

Protecting your investment- If you are really selling electricity back to the hydro under the micro FIT program, you would want to make sure that your system is working in tandem for couple of decades. Proper grounding requires skill; each and every step of installation needs to be done with minute care. It ensures the safety and security of each and every family.

A final note about the certification- Almost any licensed electrician, will tell you they are capable of installing your solar. Without underestimating their expertise it would be wise to narrate that they might have the knowledge but they at times lack the exposure and experience. Day-to-day AC residential wiring is not the same as solar DC and some electricians might not have worked with DC since the primary level. It is to be noted that they might not be familiar with the codes. All you need to do is look for an installer who does have proper certification and have adequate knowledge.

If you are looking for professional advice you would like to receive free quotes for solar panel installation. All you can do is simply fill out the form and we would get back to you within 24 hours.

Will Hail Damage My Solar Panels? →

Protecting Your Solar From Pests

Both rooftop and ground-mounted solar arrays are designed and engineered to withstand a myriad of environmental conditions. High wind, hail and even lightning strikes are no problem for a well engineered system. One persistent issue that can plague owners of solar, however, is pests, like birds and rodents. As with chimneys, rain gutters, eaves, overhangs and other architectural features of a house or commercial building, solar arrays can make attractive shelters for pigeons, starlings, squirrels, roof rats and other uninvited guests.

Both the roof tops and ground-mounted solar arrays are being designed and designated in order to withstand a myriad environmental condition. Tumultuous weather condition will have no effect on the engineered system. One of the issues that each and every owner faces is that with pests and plague.

We've recently received a request from one of the solar system owners in Vaughan, ON:

"I already have solar panels installed – it is a 10 kW system. I am in need of a company to come to my house and remove one (possibly two) rows of installed panels (including track) on the WEST side of the house only. A roofing company will be replacing the roof vents with metal vents, due to a squirrel problem."

What kind of problem, you might ask? Well…rodents in particular love to chew on wires:

Example of rodent damage to PV wiring, as cited by Ray Yousef, ESA

This is true for all wiring, not just solar, but it is because the cables on the solar panels carry high voltage

DC that is easily being accessible to varied animals To address this issue, section 64-210 (5) of the Ontario Electrical Safety Code “requires mechanical protection against rodents for PV source circuit conductors on or above a building, where the dc arc-fault protection (when required) is not located at the module.”

This really means firstly wiring all the roofs or down from the roofs needs to be encased in conduit. This is just a common practice. For the electrician as there is no exposed cables that run unprotected. However the flexible, unprotected cable that connects the panels in a string together needs to to be protected at the same time.

Then make sure that the cable is secured to the panels or rack with the wires ties located within 300mm of every box or fitting at intervals of not more than 1 m through the entire run. This keeps the cable from hanging down below the rack and touching the roof.

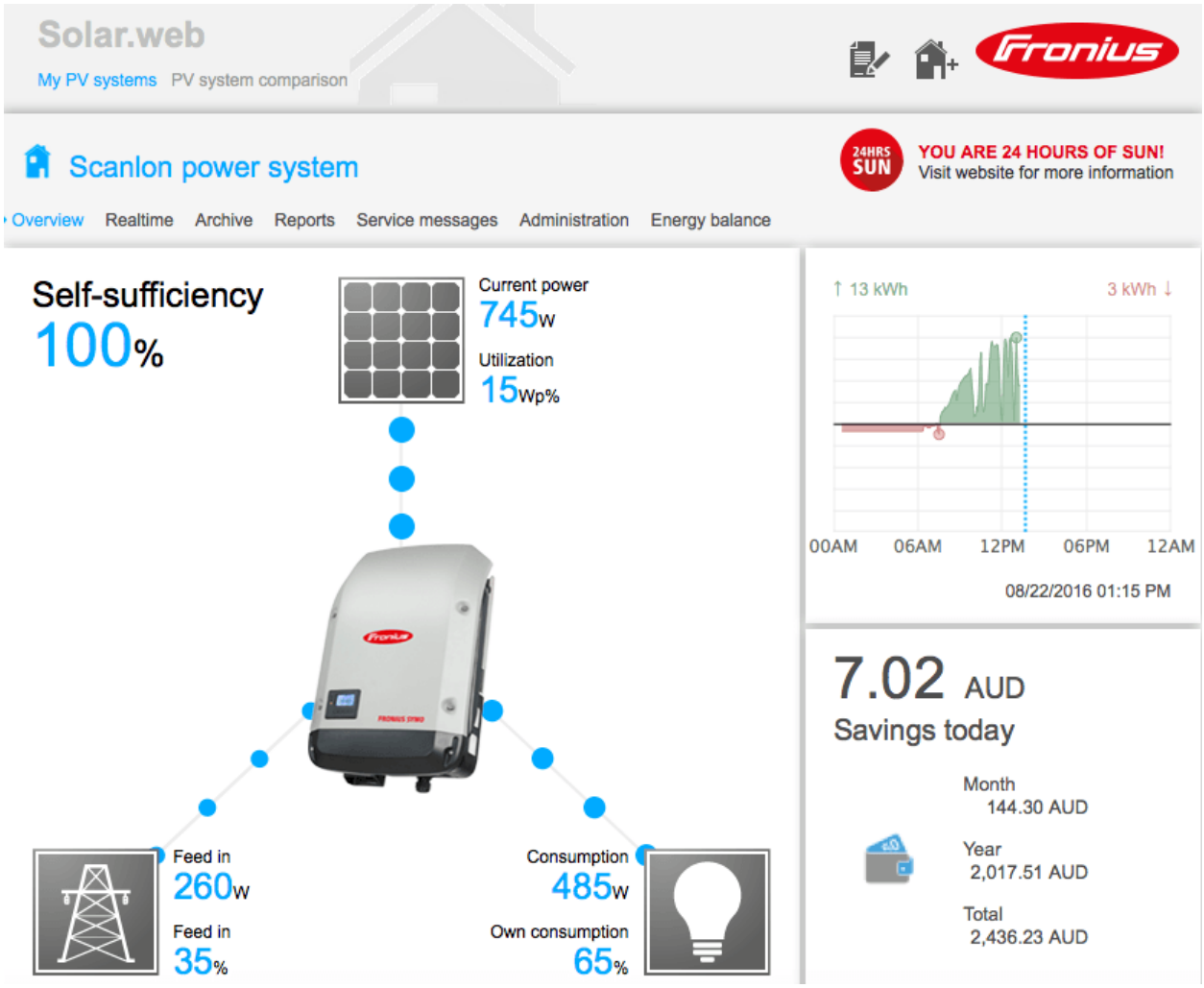
After all the aforementioned details next in and around the panels are the racks along with the screen or mesh. These are being used to keep the critters from getting access to the underside of the array. It is to be needed that mesh needs to be wire screening with varied openings not really greater than 13 mm to acceptable for protection against rodents. These materials include:

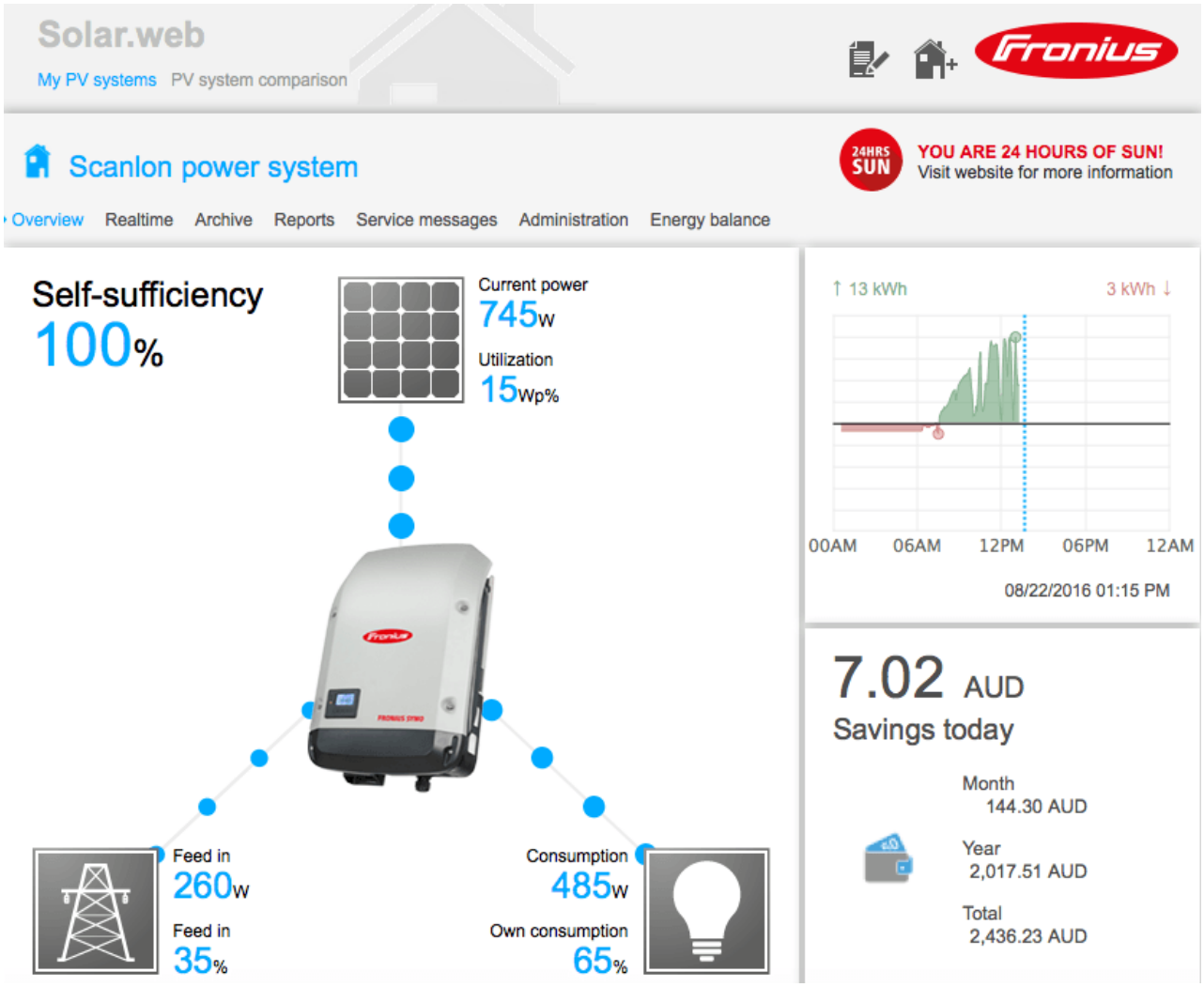
- Expanded metal
- Solid metal
- Screening

Before the installation keep it in mind that airflow is to be avoided. This also means that the screens are needed to be clear having no relics. Mounting the screen requires a bit of Midas touch, other ways of attaching screen to the rack or panels through the usage of specialized clips.

Spiffy Clips and SolaTrim are two products made especially to protect rooftop solar from animal damage. The final approach that you need to note is installation of a solar panel requires a daunting

task, so do not make the squirrel or rats to chew up the cables. The investment in animal protection is well worth the cost. Off late as according to Ontario electrical code, it is a requirement.




Solar.web
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PV system comparison
Fronius
Scanlon power system
24HRS SUN
YOU ARE 24 HOURS OF SUN!
Visit website for more information
Overview
Realtime
Archive
Reports
Service messages
Administration
Energy balance
Self-sufficiency
100%
Current power
745W
Utilization
15Wp%
↑ 13 kWh
3 kWh ↓
00AM
06AM
12PM
06PM
12AM
08/22/2016 01:15 PM
Feed in
260W
Feed in
35%
Consumption
485W
Own consumption
65%
7.02 AUD
Savings today
Month
144.30 AUD
Year
2,017.51 AUD
Total
2,436.23 AUD

8.Fronius monitoring system

How Long Will My Solar Panels Last?

Cost of solar panels in Ontario →

Efficiency of solar panels

As far as the world of solar photovoltaic (PV) technology are concerned, the researchers are still continuing to strive towards converting more and more sun's energy into electricity with smaller and smaller solar cells. Numerous worlds' leading manufacturers of solar panels are already bringing forward high ended efficiency products that are capable of producing more and more power while using less roof space. Thereby a question arises, how can one decide on which panels to purchase when there is wider range in efficiency?

How Efficient ARE Solar Panels?

It really seems that like every other month there is a specific story in the news about researchers setting up the latest records for measuring the efficiency. They are trying in a constant manner about the ways through which sunlight hits the cell and keeps it cool and thereby it can perform in a better manner. It was reported by a Japanese organization that the solar cells was performing at over 26% efficiency and another organization claimed that it hit under 50% under specific laboratory conditions. But what does that percentage mean?

The calculation that resulted in the percentage of efficiency is quite complicated, but it really involves measuring the amount and the spectrum of sunlight hitting the cells along with the cell temperature. It is to be noted that the output voltage cell as being compared to the energy in as photons of sunlight generally determines the percentage.

At what is called Standard Testing Conditions (STC) the power coming in is 1,000 watts per square meter (m2) and power out is the rated “maximum power point.” As for example, a panel measuring 1 m2 rated at 150 watts maximum power point would be performing at 15% efficiency. That’s because 150 watts/m2 ÷ 1,000 watts/m2 = 15%.

The characteristic crystalline cell efficiency range runs from 12% to 15% and amorphous silicon modules run between 6% and 7%. Given that most of the solar panels on the market at present carry out at fewer than 20% efficiency, there is clearly a lot of room for improvement in the field. The most efficient panels available are rated at 22-23% efficiency.

How Much Efficiency Do You Need?

High-efficiency panels are going to the homeowner you more money per watt, but there are several factors that may make these more expensive panels attractive. The total installed cost may not go up that much when the entire system is taken into account.

The high efficiency solar panels are going to the homeowner, but there are numerous factors that might make these panels more and more expensive and attractive. The completely installed cost might not really go up that much while the entire system is taken into account.

Roof Space: If you have limited roof space, high-efficiency panels may be the only way for you to produce the amount of power you want.

Balance of System (BoS) costs: Fewer panels means a miniature rack, fewer micro inverters, less wiring and less labor to install.

As for instance, LG makes several panels of the same size but with different rated outputs ranging from 280 watts to 320 watts. If there is only room for ten panels on a roof, using efficient panels would be the corresponding for adding 1 ¼ more panels to the array, while the BoS costs remain equal.

In maximum cases where room is not an subject, the lower per watt sub-20% competence panels usually make more financial sense. But when you need to put aside room, high-efficient panels are a humongous option.

Cost of solar panels in Ontario

Alberta Launches Solar Panels Incentives Program

The program is generally being called RCSP which generally stands for Residential and Commercial Solar Program. If your own dwelling place in Alberta are looking towards installing panels you can now receive 30% off your solar panels system cost up to a maximum of $10’000. The $0.75/watt solar rebate is being based on the total installed ability of the project.

Ground mount or rooftop residential solar paneled system are completely limited to 15kWp DC in size which equals 60 panels of 250 Watts each as estimated. At the same time if you are business or nonprofit organization in the location of Alberta, the respective solar panels 25% or $500’000, whichever is more. The solar farms and the arrays are being limited to 5MW in size. The rebate value set at $0.75/watt as well.

In order to qualify for the particular program, the residential solar panel system must be completely engineered in a span of 6 months. At the same time the commercial and nonprofit panels work for within a single year of the Part I approval date. After installation work is being done you need to submit all the expenses to the house of Energy Efficiency in Alberta. The approval and allocation of funds will occur on a first-come, first-serve basis.

If you are interested in finding out how much solar panel cost, or looking for a qualified solar panels installer in Alberta, visit www.alberta-solar-installers.ca, fill out a request form, and receive Free Quotes for your solar panels installation.

The Alberta Residential and commercial solar program guidebook will surely be helping you to understand the eligibility requirements. At the same time you can get proper explanation on explain financial solar incentives and describe steps required to participate in the program. If you are interested towards finding out how much solar panel cost you can log in to www.alberta-solar-installers.ca.

Efficiency of solar panels

Alberta Launches Solar Panels Incentives Program →

Cost of solar panels in Ontario

For maximum potential customers, the main motivation for considering the purchase of solar array break down into a combination of personal priorities. Numerous individual have environmental motivations. They are in want to decrease the carbon footprint. The other individuals like the ideology, of being more self reliant. One of the things everyone has in common, though they would generally like to save more money, by making their own power.

How much will solar panels cost for an average Ontario customer?

According to the **Ontario Energy Board**, the average Ontario household munches through about 9,000 kWhs of electricity in a maiden year. This means that to offset 100% of their electrical use, an average Ontario homeowner would need to install an approximately 7,500 Watt solar array. With a current installed cost per watt of solar generation at between $2.50 and $3.00 per watt, that means that a 7,500 Watt solar array is going to run somewhere between $18,750 and $22,500.

"What kind of payback can I expect on solar?"

Simple payback is one of the equations: system cost ÷ value of energy produced = years to payback. Sounds good? Not really, it is because electric rates are constantly changing.

They will go over time, so usage of current rates will indeed provide a realistic payback period. In addition to that rates do change throughout the day for numerous customers, thanks to the time of day pricing.

Most of the power being produced by solar are being determined mid-peak to the optimal peak time. All it can be said is that the value will range in between that of 13.5 and 18 cents. For a rapid calculation the paybacks of your Net metering solar panels system generally check out our Solar Net Metering Calculator. If you are interested towards finding out how much income your project can bring about take a glance at our solar micro FIT calculator.

Subsidies decrease payback

The real payback period for Ontario residents depend on contribution in one of a figure of obtainable agenda.

Net metering is, nothing but one of the "trade" of electricity you provide versus electricity you chomp through. Surplus electricity is made available to the local distributor. Recognition for that surplus is practically being applied towards your energy bill, Limited to systems of 500 kilowatts or less.

Under the **micro FIT program**, you will be paid a certain price for all the electricity your project produces for couple of decades (40 years in the case of a hydro electric project).

New technological progression means lower prices

As solar is becoming more and more popular and is well accepted, the price of a solar array is coming down as the time flies by. New energy storage space technologies and varied progression will be the next big aspect in solar, and that could offer consumers a whole latest set of options. In the interim, thanks to current programs, it is a great time and leap forward to consider solar for your home.

Thanks For Reading Our E-Book For Details Visit

http://blueskysolar.today/