



Why do we want to Run on Sun?

Solar Panels

Solar panels convert sunlight into energy. They are a reliable and well tested source of clean renewable energy and they don't create any pollution, greenhouse gas emissions or noise.

Solar panels can be installed on the roofs of buildings or on the ground in solar farms, quickly and easily. On a building there is no planning permission required and the sun's rays are instantly turned into either heat or electricity to be used on site.

There are two main types of solar panels. Solar Photovoltaics (solar PV) which convert the sun's rays into *electricity*, and Solar Thermal panels which convert the sun's rays into *heat* and can be used to heat water or for space heating.

In Ireland, most of the solar panels you will see on people's homes are solar thermal panels for heating their hot water. This is mostly because grants are available for householders to install this type of panel. However, for the rest of the world, when people speak about solar panels they are generally speaking about the types of panels that generate electricity, solar photovoltaic.

Ideally a solar panel is placed facing due south, unshaded and at an angle of 30°. In Ireland a typical residential system could provide **50%** of a household's annual electricity.

Energy from the Sun, in Ireland?!

Although Ireland is not known for its year round sunshine, it is actually *visible light* that drives solar panels. We typically think that when the sun is not out, there wouldn't be much solar energy, however even on grey or cloudy days solar panels keep generating energy.

A solar panel in Ireland is as good at generating electricity as anywhere else in the world at the same latitude. Unsurprisingly the best solar resources in Ireland are in the southern counties, Wexford, Waterford, and Cork

As a comparison, 1.5 million Germans generate solar electricity on their roofs, and in the UK 10 GW of solar PV has been deployed since 2010 when a financial support system for solar was introduced.

In Ireland there is less than 1 MW of solar electricity installed!



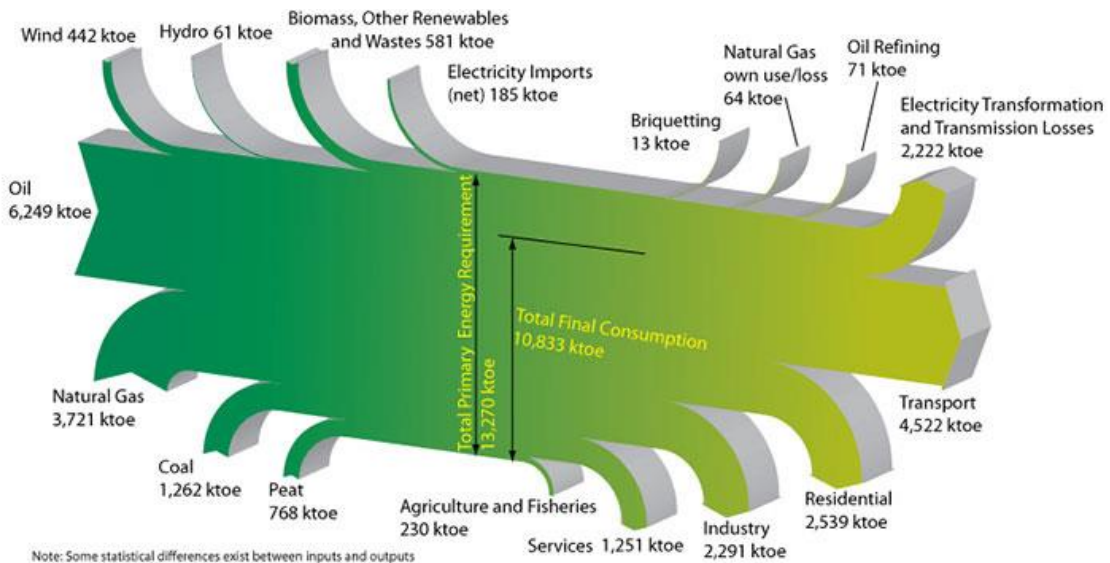
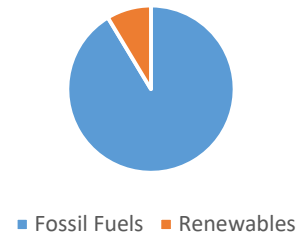


Ireland's Energy Mix

When we talk about energy needs, we usually mean the energy or fuels that are needed for transport, buildings and electricity. Ireland imports about **85%** of its energy needs at a cost of about **€6.5 billion** a year. 91% of this energy is derived from fossil fuels; oil, gas, coal or peat. The rest, 8.6% is from renewables, the majority of which in Ireland is wind energy.

In electricity, the amount of renewable energy that is used is growing. In 2015 renewables accounted for about 23% of all electricity. Of all the renewable electricity generated in Ireland in 2015, about 80% of it came from wind energy, while the remainder came from hydro, landfill gas, biomass (including a small percentage of wastes) and other biogas. There is so little solar energy generated in Ireland, it does not figure in national statistics.

Imported energy - Source



Source: Energy in Ireland, Sustainable Energy Authority of Ireland 2015 (2014 data)



Why would solar be good for Ireland?

Generating renewable energy reduces our dependence on fossil fuels and reduces our imported fuels. Reducing our dependence on fossil fuels not only reduces our carbon emissions, but it means keeping money in Ireland instead of spending it on fuel from places where there tends to be lower human rights standards, greater political instability and often significant local environmental impacts.

Ireland has the second best wind resource for energy in Europe, however in order to have a balanced system we need to use lots of sources of renewable energy. Solar energy and wind energy work well together, as although both provide intermittent power, they tend to be at their peak at opposite times of the day.

Does Ireland currently support Solar Electricity?

No. Solar electricity in Ireland is different from many countries because Ireland does not currently guarantee a **fair payment** for solar electricity. So while wind or hydro generators benefit from a guaranteed minimum price when they export their energy to the national grid, solar generators do not.

Because solar panels cannot generate energy 24 hours a day, for a roof top solar system to work, it needs to be installed either with batteries so that the energy generated can be stored, or there needs to be a system which allows both the sale of excess electricity when it is not all used on site and the opportunity to buy it back when it is needed. As this buying and selling cannot happen in Ireland, and batteries are not yet cost effective enough, there is very little solar installed in Ireland.

The same is true for all micro generators (small generators). Indeed, regardless of the renewable technology, micro-generators cannot sell the excess power they produce.

For example, if a school were to install a solar pv array on its roof, when the students are at school and the school is using lights, photocopiers and computers etc., they will be powered by their own solar power. However, on weekends and throughout school holidays, the panels will still be generating power and that power will be given away to the national grid for free. On the current costs to install solar panels, the time it takes to break even from savings on bills is just too long to make it economically sensible.

For a solar farm, it is a little different as there is no need to use the electricity on site. In this case, the solar generator needs to feed into the grid and get paid for the electricity. Without a payment for solar energy, like there is for wind or biomass or hydro, a solar farm does not make financial sense. The lack of a fair payment for solar energy and for micro generators makes the economics of installing solar panels very challenging.





Solar PV at Aran Bike Hire, Aran Islands
Energy Co-operative, Aran Islands

Does Ireland subsidise other Renewable Energy?

Yes. Consumers pay, through the Public Service Obligation (PSO) levy to support domestic electricity (peat, and some forms of renewables including, wind, hydro, biomass, biogas, landfill gas and energy from waste). Until this year we also subsidised a number of gas power stations.

The PSO for 2016 cost all residential customers €6.02 a month.

The money raised is used to make up the difference between the market price of electricity and the minimum price that has been guaranteed to those generators.

If the market price for electricity is high, there is less of a gap between the market price and the guaranteed price, so the PSO is lower.

If market price is low, there is more of a gap between the market price and the guaranteed price, so the PSO must increase to cover that gap.

In general, renewables lower the wholesale price of electricity, so as the unit price decreases, the PSO covers the difference.

The Irish Solar Energy Association estimates that a subsidy for solar energy would add 1% to domestic electricity prices.





Ireland's largest Solar PV installation, County Hall Clonmel, Tipperary

Why do we need Renewables?

Everybody knows fossil fuels release carbon and contribute to climate change.

Not only do we have European obligations to reduce our carbon emissions, we have a global obligation under the Paris Agreement to do the same. We are way off track in meeting our 2020 carbon reduction targets, and our renewable energy targets.

2015 was the warmest year on record. Global temperatures are about 0.8 degrees warmer than pre-industrial times. July 2016 marks the 15th consecutive month a monthly global temperature record has been broken—the longest such streak since global temperature records began in 1880.

The Intergovernmental Panel on Climate Change Report from 2014 suggests the world needs to triple the energy we get from renewable sources to have any chance of containing carbon emissions to safe levels. Ireland has negotiated its European commitments to a point where we are likely not to make any reductions from the agricultural sector, therefore the result is we must make carbon savings from the buildings, energy and transport sectors, and that means transitioning away from fossil fuels. The part of the PSO that supports renewables helps in that transition.

Definitions

Feed in Tariff (FiT): is a guaranteed price for electricity for a set number of years (usually 15), so regardless of the market price, the generator gets the FiT. This provides much needed financial certainty to renewable generators.

Contract for Difference: is a contract between a buyer and seller of electricity. The seller is paid the difference between the 'strike price' (a price for electricity reflecting the cost of investing in a particular low carbon technology), and the 'reference price' (a measure of the average market price for electricity). It gives greater certainty and stability, whilst protecting consumers from paying for higher support costs when electricity prices are high.

Energy Facts

MW's of Wind Energy installed in Ireland: 2,441 MW (2015)

One average sized wind turbine from a modern wind farm: 3 MW

Size of a solar farm: 2-3 ha per MW installed

MW's of Solar Energy installed in Ireland: < 1MW

Ireland's EU 2020 Renewable Targets:

Electricity (40%), Heat (12%), Transport (10%)

Ireland's progress to meeting the Renewable Targets as of end 2014 (the most recent data available):

Electricity (22.7%), Heat (6.6%), Transport (5.2%)





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the Earth**