

# The Green Economy: Renewable Energy

Harnessing renewable energy holds the key to powering our world in a safe and sustainable way for generations to come.

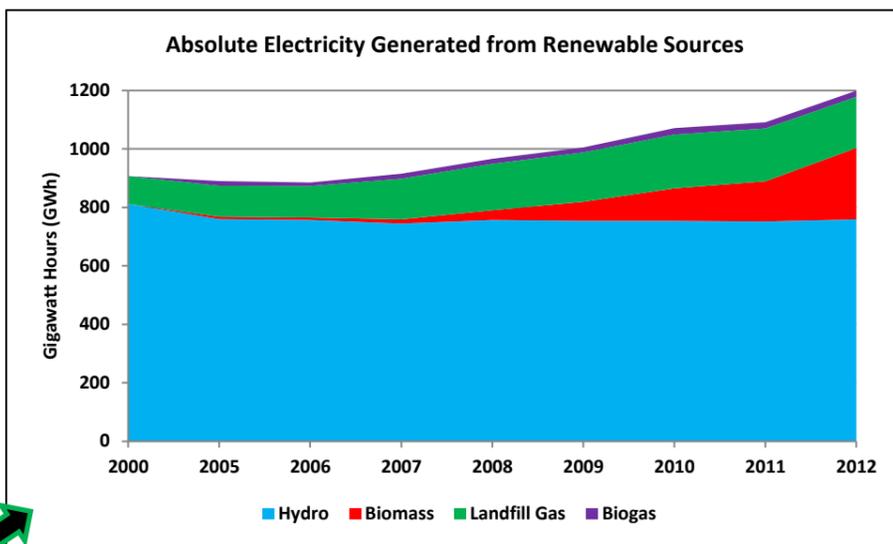
## DID YOU KNOW???

(Data Sourced: GreenAware)

- 390,000,000,000,000,000,000,000 Watts**  
Power of the Sun per second
- 172,000,000,000,000,000 Watts**  
Power the Whole Earth receives from the Sun
- 15,000,000,000,000 Watts**  
World Wide Energy Use
- 10,000,000,000 Watts**  
Bolt of Lightening
- 2,240,000 Watts**  
Irish Rail Dart
- 25,000 Watts**  
Average Household Usage
- 8,500 Watts**  
Electric Shower
- 3,000 Watts**  
Boiling a Kettle
- 1,100 Watts**  
Standard Washing Machine
- 1,000 Watts**  
Toaster
- 500 Watts**  
An Electric Eel
- 300 Watts**  
Standard Refrigerator
- 250 Watts**  
LCD TV
- 110 Watts**  
iPod Docking Station
- 100 Watts**  
Standard Light Bulb
- 75 Watts**  
Playstation
- 60 Watts**  
Laptop
- 35 Watts**  
Standard 15" LCD Monitor
- 40 Watts**  
Amp
- 30 Watts**  
Small Stereo
- 12 Watts**  
CFL Bulb
- 7 Watts**  
Phone
- 3 Watts**  
LED Spot Light
- 0.5 Watts**  
Mobile Phone Charger

In recent years Ireland has seen a big increase in electricity produced from renewable sources – most of which has come from wind farms.

From 2000-2012, electricity generation from 4 separate sources only rose by 23%.



However, wind generation was nearly 4 times this in 2012. If Ireland is to achieve a sustainable, long-term, and secure energy future, it is important to supplement the growing wind energy production with further investment in other renewable technologies to offset possible market and generation fluctuations.

## Hydro Power

**212 MW**  
14 large hydroelectric generators connected

**25.5 MW**  
Further 58 micro (< 1 MW) generators connected

There is scope to increase our hydroelectric power output but caution must be exercised... See [Benefits](#) & [Drawbacks](#)

Benefits	Drawbacks
<ul style="list-style-type: none"> <li>A very efficient technology (&gt;95% efficient turbines).</li> <li>No associated greenhouse gases after initial installation.</li> <li>Many argue it's a more reliable technology than wind as river flow is more constant than wind.</li> </ul>	<ul style="list-style-type: none"> <li>Can have detrimental effects on river quality.</li> <li>Requires the use of dams which can alter the ecosystem and flow of a river.</li> <li>Requires a fast flowing river all year round.</li> </ul>

There is also scope to exploit the vast potential of our ocean resources.

### Tidal Energy

The resource has been estimated at 0.92 TWh per annum. This would equate to 3.3% of total electricity demand for 2012.

### Wave Energy

There is far greater potential in this area with estimates of 21 TWh per annum. This would equate to 76% of total electricity demand for 2012.

- Government Target of 500 MW by 2020
- REFIT payment of 22c/kWh
- In 2008, a full scale test site was developed off the coast of Mayo
- No commercial wave energy device yet exists despite a number of prototypes.

## Biomass

Oldest form of fuel on the planet, burning of wood, grasses, crops, agricultural and municipal wastes to produce heat.

But, how is the burning of fuel a renewable source of energy?

Biomass is referred to as carbon neutral. There is no net increase in CO<sub>2</sub>.

Much of this resource in Ireland is used primarily in heating. However, in recent years solid biomass has been used in conjunction with fossil fuels in power plants!

As of 2011, only 1.1% of biomass is used in this way – there is a 2015 target of 30% biomass co-firing with peat in 3 state owned plants.

In 2012, biomass contributed the following...

- 0.9% of Gross Electricity Consumption.
- 4.5% of Renewable Energy Produced.

## Landfill Gas

- 22** landfill generators connected to the distribution grid!
- 45 MW** Maximum Export Capacity
- 9.8 MW** Further contracted for connection to the electricity grid
- 174 GWh** Produced in 2012
- 0.63%** Gross electricity generated

SEAI point out that future growth in this industry is unlikely due to restrictions on waste being sent to landfills in the future.

## Solar

Solar energy in Ireland is almost exclusively installed in residential properties to aid in hot water heating. ~70% of annual household hot water demand can be satisfied with a solar panel

Kingspan Renewables, based in Armagh are one of only two European companies designing and manufacturing solar evacuated tubes. The tubular design is 30% more efficient, much lighter reducing the cost of installation, and requires 50% less surface area than standard flat designs

Every hour, enough solar energy bathes the Earth to power the planet for an entire year!

The total area of solar panels required to meet worldwide energy demand is perhaps smaller than one would imagine.

## Facts

University of Michigan, Professor Michael Bernitsas: "harnessing just 0.1% of the energy in the ocean could supply energy to 15 billion people".

SEAI: "Since 1990, CO<sub>2</sub> avoided from renewable energy has increased by over 300%; Where in 2012, 3,119,000 tonnes of CO<sub>2</sub> was spared".

Peak Students: "Surveys have shown the resource base for geothermal energy is larger than coal, oil, gas and uranium combined".