

# Factsheet No. 1

## Electricity Generation and the Sound of Islay Tidal Energy Project



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Following the decision in March 2011 by the Scottish Government to grant consent for the Sound of Islay Tidal Project there have been a few questions about the amount of electricity it will generate and how it will connect to the power network. The project will connect to the existing electricity grid and the electricity distributor SHEPD (Scottish Hydro Electric Power Distribution) has specified that some of the lines and equipment that are used to transport electricity to and from the mainland will need to be upgraded. This may have a positive effect but it is more likely that these changes will go unnoticed by electricity users.

Every year, the Sound of Islay Tidal Project will generate about the same amount of electricity as is consumed on Islay and Jura. When the tidal stream is strong, the electricity will flow to homes and businesses on Islay and Jura and only a small amount would be transported back for use on the mainland. During the slack water periods the turbines will cease generating and electricity will flow from the mainland to Islay and Jura.

The tidal project will have ten turbines each of which can generate up to 1 MW (megawatt). Taking into account the varying speed of the tidal flow the ten tidal turbines will each produce an average of 350 kW. If they operate for 24 hours per day and 365 days per year then this would give a total output of 30.66 GWh (24x365x10x350). Coincidentally, a report carried out on Islay's electricity demand showed that Islay uses approximately 28GWh per year. It is therefore fair to say that the tidal project will generate more than the amount of electricity that is used on Islay every year.

To put the scale of the project into context, a typical home in the UK uses about 4,700 kWh of electricity every year. The electricity generated by the Sound of Islay project will be equivalent to the amount of electricity consumed by over 6,000 homes typical UK homes. Interestingly, the average electricity usage in Argyll and Bute is nearer to 7,400 kWh due to the wide use of electricity for heating.

Power is measured in watts (named after the Scottish inventor and engineer James Watt). For comparison a modern energy-saving lightbulb uses about 10 W and a single bar electric fire uses about 1 kilowatt (1000 watts). 1 MW (megawatt) is made up of one million watts and 1 GW (gigawatt) is made up of one billion watts.

Energy (and the quantity of electricity that is generated) can be measured as the amount of power for a period of time. For example, running a one kilowatt device (such as an electric fire) for one hour uses 1 kWh (kilowatt hour).

The tidal project faces significant engineering challenges and there is more testing to be done on the final turbine design to ensure the project is successful. Encouragingly, a similar design of turbine has been operating successfully in the sea off Norway for six years and a single tidal device from a different manufacturer in Strangford Lough in Northern Ireland has produced more than 1 GWh in less than six months. These examples show that tidal devices can be reliable and effective and if the Sound of Islay project can demonstrate how this can be done on a larger scale then the possibility of generating significant proportions of electricity from the tides around Scotland is very realistic.