

dti
Low Carbon Buildings Programme



Segen is meeting the need for affordable clean energy

Segen is committed to the production of clean and affordable energy through the development of sustainable energy generation projects.

Segen is an authorised distributor and installer for the **Iskra 5kW** turbine installed at Tebbutts Farm, which is the most efficient and cost effective small wind turbine in its class currently available on the UK market. The Iskra small wind turbine generates exceptional levels of power even in relatively low wind conditions.

Segen can supply, install and support the Iskra turbine to power community and local authority projects, farms, country estates, industrial units, rural domestic properties, offices, schools and many more applications.

Segen works in a partnership with site owners, financiers, suppliers and other stakeholders to guide projects through the process until the energy starts to flow and beyond.



Case Study Tebbutts Farm, Loughborough

Tebbutts Farm

Peter Lister, at Tebbutts Farm, was one of the first customers in the UK to get an **Iskra AT5-I** small wind turbine, which was installed back in May 2004 and has been reliably operating ever since.

Peter lives on a farm at Normanton on Soar near Loughborough and uses the power from his turbine for his house, as well as selling surplus power back to the electricity power supplier

Being one of the first installations, it was undertaken by members of Iskra's development team, then based out of Nottingham, who used the installation to test their procedures and documentation.

Peter received a grant of £5,000 from the Clear-Skis program, which has now been replaced by a similar scheme called the Low Carbon Buildings Program (LCBP).

Peter has also very kindly allowed his site to be used by the nearby Iskra product development team to test new equipment and there is now an anemometer and data logging equipment installed at Peter's site, measuring and recording various aspects of the turbine's performance.



▶ Case Study—Tebbutts Farm, Loughborough

Efficient Energy

Aerodynamic

The Iskra blades are specifically optimised for low wind speed operation. An exceptionally efficient profile for the blade aerofoil has been adopted and the blades are longer than is usual on a machine of this rating. Accurate manufacture is essential to reproduce the required blade shape and keep drag low.

Also, the passive pitch control allows the blades to be at the optimum angle for low wind speed, pitching the blades to prevent overload in high winds.



Electrical

For very high electrical efficiency, a 3-phase generator using rare earth permanent magnets has been specially designed for the turbine.

Mechanical

The Iskra generator is designed to work at low rpm and so can be directly driven by the rotor. A gearbox is therefore not needed, thus eliminating a source of inefficiency, noise and potential maintenance problems.

The Installation

Peter's turbine was originally installed with 5m diameter blades, but these have subsequently been upgraded by Iskra and Segen to the new specification 5.4m blades for better performance, especially at lower wind speeds.



The tower is a 12m guyed tower, using guy anchors (screw in bolts), rather than the more common concrete foundations.

Iskra AT5-1 Specification

Generator rating	5 kW at 11 m/s
Rotor speed	200 rpm nominal (variable)
Cut-in wind speed	3 m/s (6.7 mph)
Survival wind speed	60 m/s (134 mph)
Rotor diameter	5.4 m
Rotor orientation	Upwind
Number of blades	3
Blade material	GRP composite
Control system	Passive blade pitching
Gearbox	None
Brakes	Electro-dynamic
Generator	Permanent magnet alternator
Yaw control	Tail vane
Tower height	9, 12 or 15 m, depending on site
Tower	Free-standing or guyed.

COST EFFECTIVE LIFETIME POWER GENERATION



Phone: 0845 094 2445
Fax: 01252 336934
E-mail: info@segen.co.uk
www.segen.co.uk

Wesley Hall,
Barrack Road
Aldershot
Hants, GU11 3NP.