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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 Lower Mount 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

### Lower Mount Farm, Todmorden

#### Lower Mount Farm

#### A Personal View from Stephen Welsh

“So why did we buy a wind turbine? Well, a few hundred yards from where we live, there’s a 24 turbine wind farm. In the other direction there are two small 5kW turbines - and they spend practically all day, every day, skipping around and making electricity.

I went to a meeting about renewable energy at the local pub and the owners of the two small turbines were there. They spoke well of Segen and had no complaints. My wife and I did lots of thinking and did a back of an envelope calculations about money saved against the cost of the investment. And then I rang Segen.

We gave the map co-ordinates of the possible location for a turbine and within the week a sheaf of papers arrived showing our mean wind speed and financial calculations showing estimated savings on our electricity bill and income from selling the surplus electricity to the grid.

And then we had a visit from Jim Robertson of Segen. We walked our field and talked about the best possible site. We talked about planning permission and the grants available. Jim gave us a quote for the turbine and that meant we could apply for a grant (it was the Clear Skies Grant scheme then). While waiting for the grant to be approved, we applied for planning permission. The information sent to us by Segen was invaluable in filling out the planning application, but if we’d wanted to, Jim would have helped us fill it in. The grant was soon approved and so the next step was to arrange the installation of the wind turbine.

At a mutually convenient date, the foundations were dug, filled with cement and left for a fortnight to dry. Then the wind turbine itself arrived and within two days it was up, spinning round and generating our own electricity. Jim arrived on the second day and brought some beer.

## ▶ Case Study—Lower Mount Farm, Todmorden

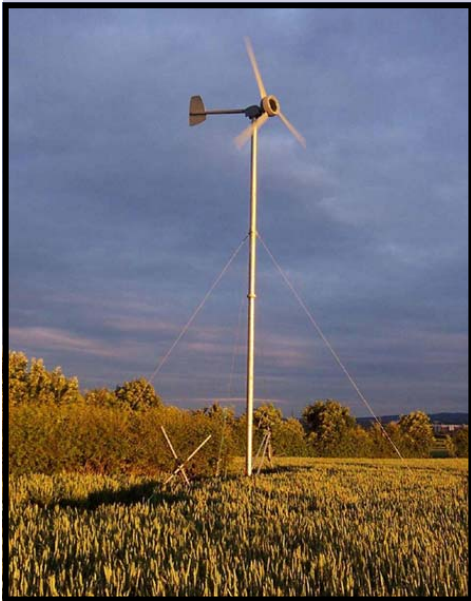
COST EFFECTIVE LIFETIME POWER GENERATION

### 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.

### A Personal View Continued ...

It's not often you spend £15,000, but the process was smoothed by Segen. Queries were answered promptly. Problems were sorted.

The turbine is capable of producing a surplus above our needs and we'll sell that to the grid. But we're also aware that the world we live in is changing rapidly. Global warming is a fact and we're committed to renewable energy. Practising what you preach is important. But also we have a nine year old child.

It's not so much about the money we might make and the pay-back period. It's about the world he'll live in 10 and 20 years from now.

I used to get tired of the wind blowing around the house. Now I don't mind."



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

Phone: 0845 094 2445  
Fax: 01252 336934  
E-mail: [info@segen.co.uk](mailto:info@segen.co.uk)  
[www.segen.co.uk](http://www.segen.co.uk)

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