EDISON

Windar Photonics

Update on strategy

Winds of change

Alternative energy

Windar's innovative low-cost, tower-mounted wind measurement system increases wind turbine efficiency and reduces operational wear. Product roll-out during FY15 was delayed due to problems with the distributor in China, which is a key market. These issues appear to have been resolved, leading to an expected ramp-up in sales beginning in Q216.

Year end	Revenue (€m)	EBITDA (€m)	PBT* (€m)	EPS* (€)	DPS (€)	P/E (x)
12/14	1.0	(1.5)	(2.0)	(0.05)	0.0	N/A
12/15e	1.0	(2.8)	(3.0)	(0.08)	0.0	N/A
12/16e	6.4	0.1	(0.4)	(0.01)	0.0	N/A
12/17e	27.1	10.4	9.6	0.25	0.0	4.1

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

Increasing energy efficiency via turbine alignment

Windar has patented a wind detection system based on a solid state laser. This reduces the cost sufficiently to deploy it on an individual turbine, where it provides real-time information about the speed and direction of incoming wind, enabling the turbine to orientate itself to maximise the power extracted from the wind and to adjust the pitch of the blades to avoid damage in high winds. Trials show that wind turbine energy efficiency can be increased by 1-4%, giving a payback of one year for a large 6MW wind turbine and around three years for the most frequently installed 1.5-2MW variants. This calculation excludes reduced maintenance costs related to stresses caused by high winds.

Revenue ramp-up expected

The January trading update noted that FY15 revenue will be within the revised revenue guidance of €950k. FY15 sales were broadly evenly distributed between North America, Europe and Asia, with a significant increase in activity in the European and North American markets. The distributor in China failed to achieve the required sales levels and has been given notice. Management is confident that revenue will increase substantially from Q216 onwards as trials carried out by utility customers and wind turbine manufactures translate to more widespread deployment. Importantly, Windar has received its first volume order to retrofit a wind park. This order, worth c $0.9m, is from a US utility and is scheduled for delivery in FY16. Our reinstated estimates show a funding gap of €1.3m, which we model as financed by debt, although management could deploy factoring instead.

Valuation range flags potential

Our valuation analysis is based on a DCF reflecting a series of potential outcomes related to market penetration and consequent volume benefits. This yields a range of fair values between £35m and £107m (excluding the impact of any FY16 funding). Receipt of further volume orders should act as a catalyst towards our mid-case fair value of £57m, which is based on the roll-out modelled in our estimates.

23 March 2016

Price	**80.0p**
Market cap	**£31m**
	£/€1.29
Net cash (€m) at end June 2015 (excluding long-term deposits and Growth Fund loan)	2.8
Shares in issue	38.2m
Free float	16.4%
Code	WPHO
Primary exchange	AIM
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	3.2	(8.6)	N/A
Rel (local)	0.4	(9.6)	N/A
52-week high/low	150.0p		72.5p

Business description

Windar Photonics is a UK-registered, Copenhagen-based developer and manufacturer of an innovative low-cost light detection and ranging (LIDAR) system. Approaching wind direction and speed is measured ahead of a wind turbine, allowing appropriate yaw alignment, increasing efficiency.

Next event

Prelims	Q216

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Windar Photonics is a research client of Edison Investment Research Limited

Investment summary: Innovative and disruptive LIDAR

Company description: Innovative low-cost LIDAR

Windar Photonics was founded to develop and commercialise a low-cost light detection and ranging (LIDAR) system. This is mounted on top of an individual wind turbine where it measures forward-looking wind direction. The information enables dynamic control of the direction and pitch of the turbine, resulting in increased power output and reduced damage from strong winds. The competitive advantage of the system is its low cost, some 70% below existing systems, enabling payback times that are sufficiently attractive to drive commercial uptake of the system.

Financials: Problems in China delay ramp-up by a year

The issues with the distributor targeted with developing the key Chinese market significantly held back product uptake during FY15, in effect delaying roll-out by about a year. Nevertheless, progress was made selling systems for trials in all three key markets, strengthening engagement with both OEMs (new-build sales) and windpark owners and operators (retrofit sales). Windar also enhanced the product portfolio and won its first volume order. Management is confident that this intensifying engagement will lead to volume sales from Q216, having already received the first volume order, which is to retrofit a wind park in the US. Our estimates assume market penetration will ramp up during and beyond the forecast period, so that during FY18 4% of all new turbines installed globally during the year (c 950 units) will be shipped with Windar's LIDAR systems and 0.6% of turbines already installed globally (c 3,200 units) will be retrofitted with Windar's systems.

Valuation: Dependent on growth assumptions

Since Windar has only recently received its first order for volume deployment of its systems, we have considered a range of possible scenarios on which to base a DCF fair value, using a discount rate of 40% and terminal growth of 2% (see page 8 for more details):

- **Low scenario:** in our low case, we forecast conservative sales from 2016 based on small market share gains, to reach c 4,400 systems in 2019. This yields an indicative fair value of £35m (excluding the impact of any FY16 funding activity).
- **Base/mid case scenario:** our base/mid case forecast scenario envisages a ramp-up in sales to c 6,100 systems pa by 2019. This yields an indicative fair value of £57m.
- **High scenario:** given the potentially disruptive nature of WindEye, we have also modelled an accelerated market penetration scenario of c 19,000 systems by 2019. This yields an indicative fair value of £107m.

The key catalyst for an uplift in the share price would be further announcements of volume orders.

Sensitivities: Related to commercial success

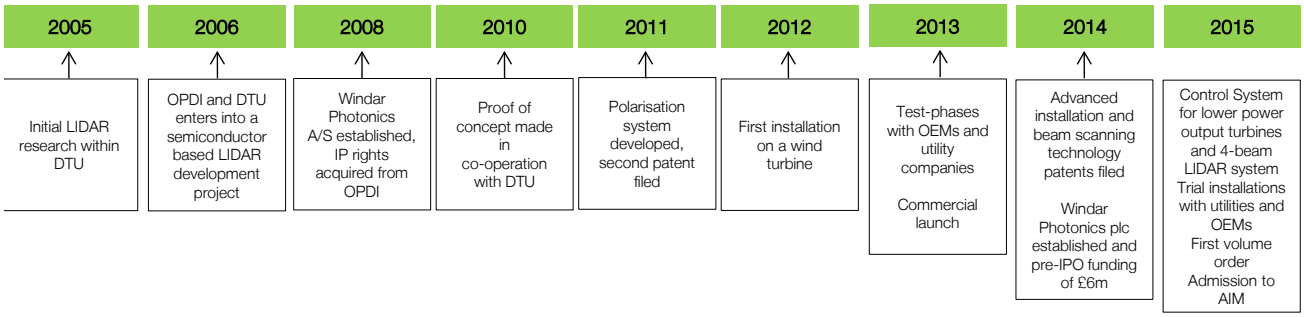
To achieve substantial scale and value Windar needs to manage a number of sensitivities:

- **Adoption of dynamic yaw adjustment methodology.** Deployment of Windar's systems is a switch in turbine control methodology and requires widespread understanding of this change in wind farm management processes.
- **Regulatory/policy impact on wind industry.** Wind turbine production and wind farm economics are in many instances driven by regulation and subsidy policies. Recent changes in Europe are less significant given the opportunities in China and the US are so much greater.
- **Shareholder post-IPO lock-ins – potential stock overhang**. Shareholders representing approximately 83.6% of issued share capital have undertaken not to dispose of shares until 30 March 2016 and to sell through the Nomad for a further six months after that date.

Company description: First phase of commercialisation

Windar Photonics was created from technology developed by founder Jørgen Korsgaard Jensen and the DTU (Danish Technical University) to develop and commercialise a low-cost LIDAR system for measuring wind speed. Unlike competitive products, Windar's LIDAR is designed for a price-point at which it is economically viable to mount a LIDAR system on an individual wind-turbine to measure the strength and direction of incoming wind directly. This information is used to adjust the orientation of the turbine in real time so as to optimise electrical power output and reduce damage to the turbine. The monetary value of the increased power output gives a payback for the LIDAR of one to three years, depending on the turbine size and local electricity tariffs. Exhibit 1 below shows the timeline of the company's development:

Exhibit 1: Windar Photonics development timeline



Source: Edison Investment Research

Windar was admitted to AIM in March 2015, at a share price of 100p. Since the IPO, significant progress has been made selling systems for trials in the three key markets of North America, Europe and Asia, strengthening engagement with both OEMs for new-build sales and with utilities for retrofit sales. The first volume order has been received and is scheduled for delivery in FY16. Management expects other volume orders to be received from Q216 onwards. As part of this broader customer engagement activity, the product offer has been expanded to include blade pitch alignment, which reduces the load on turbine blades, thus extending turbine lifetime, and integration with a wider range of wind turbines.

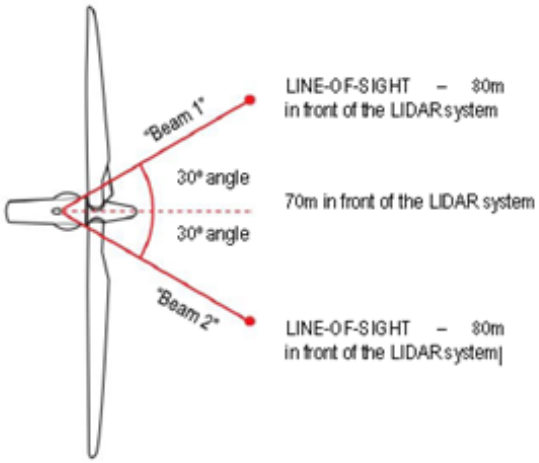
LIDAR allows accurate measurement of approaching wind

Exhibit 2: Windar Photonics' WindEye LIDAR System

Source: Windar Photonics

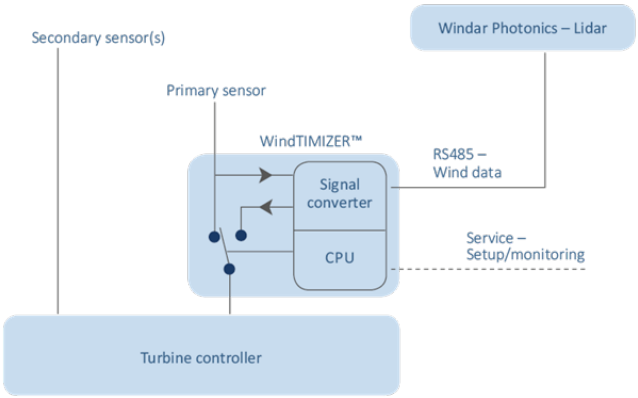
The LIDAR technique has been around since the 1970s. It is based on firing a low-power laser beam into wind, measuring the reflections of the light from moving air particles and using this information to calculate the speed and direction of the wind using the Doppler principle. Windar's WindEye has been designed for use as a turbine mounted system, using a solid-state laser as the high intensity light source, rather than relatively expensive fibre amplified lasers. This results in a system price point that is up to 70% cheaper than competitive products which have been developed from ground-based, expensive high-fidelity technology. At this lower price-point it is economically viable to mount LIDAR systems on individual turbines rather than having a single LIDAR for use across an entire wind-farm. In addition, WindEye has no mechanical moving parts, is light, compact and robust (see Exhibit 2), is easy to install and requires limited maintenance, all of which is ideal for long-term deployment on top of a turbine. WindEye emits two laser beams at 60 degrees to each other, extending 80 metres in front of the turbine. These measure the movement of particles in the air, giving precise information about the speed and direction of incoming wind (Exhibit 3). Independent tests at the DTU comparing results from WindEye and a metrological mast, which is the standard for measuring wind speed, have confirmed that WindEye measures both the speed and direction of incoming wind with precision.

Exhibit 3: WindEye two-beam measurement at 80m



Source: Windar Photonics

Exhibit 4: WindTIMIZER in action



Source: Windar Photonics

The data output by the WindEye system is fed into the turbine control system. For retrofit deployment an intermediary sub-system is required. Windar's WindTIMIZER (Exhibit 4) takes output from WindEye and converts it into the appropriate protocol for the turbine controller. It also adds a fail-safe function so that if the WindEye output is temporarily missing, as happens when the turbine blades cut the laser beams, the turbine control system defaults to the basic anemometers fitted to the back of the turbine for measuring wind after it has reached the turbine. An intermediary system is not required for OEM deployment, as in this situation the turbine manufacturer works with Windar to ensure that the turbine control system is able to accept WindEye output directly.

Reduced yaw misalignment and increased efficiency

WindEye supplies forward-looking wind direction and speed data in real time to the turbine control system. This re-orientates the turbine so that it is always head on to the incoming wind, extracting the maximum amount of energy from it. This contrasts with conventional wind measurement methodology where sensors take readings of air flow at the back of the turbine. The wind flow is distorted as it passes round the turbine, so the measurements taken of flow in this area are not the same as measurements of the incoming wind taken directly. The sensors have to be calibrated so that the true speed and direction of incoming wind can be estimated from the measurements they take in the turbine's wake. In practice this calibration is not perfect because it is very difficult to

calculate the impact of turbulence at the back of the turbine and to compensate for it. In addition, the wind sensors may be slightly misaligned: a 5 or 6 millimetre sensor misalignment can result in a 15 degree yaw misalignment, causing a 5-6% energy loss, and the terrain and neighbouring turbines may cause other distortions to the wind flow. As a result of these factors the information the turbine controller receives about incoming wind direction from conventional sensors is often incorrect, resulting in a turbine orientation that is several degrees away from facing the wind. For example, data collected from a 3.6MW wind turbine over a two-month measurement period, in which wind data from traditional sensors was compared against the more accurate WindEye measurements showed a mean misalignment during the period of 6 degrees. Numerous customer trials have subsequently confirmed that WindEye results in improved yaw alignment and yield.

Payback for operators based on energy efficiency gains

In the 3.6MW turbine example, using WindEye data rather than output from conventional sensors would have significantly reduced turbine misalignment, resulting in an energy gain of 35MWhrs, equivalent to a 2.4% improvement in efficiency. The estimated return of investment by deploying WindEye on this turbine would have been 1.5 years. Windar's system has been tested on a wide range of wind turbine types and power ratings to identify the potential efficiency improvements that could be achieved by deploying WindEye. This includes wind turbines across the power spectrum from <1mW to the largest 6mW turbines designed for offshore use. The payback period for an operator of a turbine will depend on a wide range of parameters including power rating, average yaw misalignment, price of electricity and any subsidy regimes. Exhibit 5 analyses potential payback time under a typical European feed-in tariff (FIT) regime, showing how this varies with turbine size and the increase in efficiency achieved.

Exhibit 5: Payback times at rates of energy efficiency increase, 25% load factor and FIT of €75/MW (years)

	750kW	1.0MW	1.5MW	2.0MW	3.0MW	3.6MW	5.0MW	6.0MW
1.5%	11.4	8.5	5.7	4.3	2.8	2.4	1.7	1.4
2.0%	8.5	6.4	4.3	3.2	2.1	1.8	1.3	1.1
3.0%	5.7	4.3	2.8	2.1	1.4	1.2	0.9	0.7
4.0%	4.3	3.2	2.1	1.6	1.1	0.9	0.6	0.5

Source: Windar Photonics

As can be seen, the larger the turbine, the quicker the payback period, although the payback period is attractive for most scenarios involving turbines of 2.0MW power or greater. 1.5MW and 2.0MW turbines account for the greatest proportion of the current globally installed turbine fleet, providing a substantial retrofit opportunity. Improved yaw alignment also causes additional stress loading on the turbine components, resulting in premature wear and tear and accelerating the maintenance cycle. The financial benefits of reducing loading provided by Windar's LIDAR are excluded from this analysis. The incremental cost of a Windar LIDAR (<€25k) is not significant compared with the cost of a turbine (c €1m/MW).

Improved pitch alignment and reduced wear

Accurate real-time information about incoming wind warns the turbine about sudden excessively strong gusts of winds, enabling it to twist the turbine blades so that the flat of the blade does not receive the force of the wind full on. This reduces the associated wear, increasing the potential life of the turbine components and lowering maintenance costs. Third-party testing has shown that forward-looking LIDAR sensors can reduce stress on the blades, gearbox and associated components by at least 10-14%. This benefit is not included in the payback scenarios above.

In response to those turbine OEMs who are keen to offer improved pitch alignment, Windar is currently developing a four beam LIDAR, which provides anticipatory pitch control and gust prevention as well as yaw alignment. This new product, WindVISION, which is intended as an alternative to WindEye rather than a replacement, is scheduled for launch later in 2016.

Market opportunity

Windar's products are used in the wind turbine market. This market is forecast to continue to grow as energy policies across the globe demand increased contributions from renewables and wind power is an established and proven technology. According to the Global Wind Energy Council (GWEC), 63GW of wind turbine capacity were installed globally during 2015, a 22% year-on-year increase, bringing the cumulative installed capacity to 432GW.

Exhibit 6: Regional analysis of global installed wind power capacity

Total installed capacity end 2015 (GW)			Capacity installed during 2015 (GW)
PR China**	145,104	PR China**	30,500
USA	74,471	USA	8,598
Germany	44,947	Germany	6,013
India	25,088	Brazil*	2,754
Spain	23,025	India	2,623
UK	13,603	Canada	1,506
Canada	11,200	Poland	1,266
France	10,358	France	1,073
Italy	8,958	UK	975
Brazil*	8,715	Turkey	956
Other	66,950	Other	6,749

Source: Global Wind Energy Council. Note:*Projects fully commissioned, grid connections pending in some cases. **Provisional figure.

China is the largest market with respect to both annual installations and installed capacity as its government is implementing policies intended to reduce dependency on coal for energy generation and the associated smog affecting its major cities. The legislative environment in the US continues be supportive, following a bi-partisan vote by Congress in late 2015 for a multiyear extension of the Production Tax Credit and the alternative Investment Tax Credit through to 2019. GWEC predicts annual capacity installed globally to grow with a 5% CAGR between 2014 and 2019, though we note that its 2015 forecast of 53.5GW was substantially lower than the actual amount.

Market opportunities and partnerships

Assuming that the current mean turbine rating is 2.5MW, the GWEC statistics represent around 175,000 turbines installed globally, with approximately 25,000 new turbines delivered each year. Windar is addressing the installed base through contact with the owners and operators of wind farms. It is addressing the new-build market though relationships with OEMs, with the goal of integrating LIDAR with turbine control systems during manufacture. The sales cycle is lengthy, with potential customers purchasing individual units for use on in situ trials before committing to a volume purchase. A major milestone was reached in FY15 with the first volume order, which is from a US utility to retrofit a wind park. The contract value is c US$0.9m, for delivery in 2016.

Wind farm owners and operators

Windar has a significant number of trial installations with utility companies in Asia, Europe and North America. These are providing results that confirm the attractive business case for the adoption of WindEye and WindVision. Windar has supplied six of the top 10 wind park operators globally by market share. Following the order received in FY15 for the US windpark retrofit, management expects other volume orders to be received from Q216 onwards.

OEMs

Four out of the top 10 turbine manufacturers have already successfully tested Windar's system and have entered the development stage of direct turbine integration. As a result of this activity, the product offer has been expanded to include blade pitch alignment and integration with a wider range of wind turbines.

Sales channels

Some of the funds raised at the time of listing have been used to strengthen the sales team in Denmark and to establish local sales representation in China, Spain, Germany, Brazil and the US. Windar had intended to access the Chinese market via an exclusive distribution agreement with Swiss-based TRES Wind who have a good relationship with the Chinese wind turbine manufacturer Shanghai Taisheng Wind Power Equipment Co. The distribution agreement was dependent on certain sales levels being achieved in 2015. There were installation issues on the initial deployments in China, so these levels were not reached. Consequently Windar has decided to terminate the agreement and access the Chinese market direct through its offices in Beijing and Shanghai. We understand that the initial installation issues have been resolved and that the revised arrangement is working well. This is important given that China is the largest market with regards to both cumulative installed capacity and annual deliveries.

Competitive environment

Windar's LIDAR has been designed using a solid state laser, resulting in a substantial price point discount to peers (Exhibit 7). Since the use of a semiconductor laser is a fundamental differentiator, Windar has patents for the use of a semiconductor laser in a LIDAR wind sensor in Russia, the US and Europe with applications filed and pending in India, China and Japan.

Exhibit 7: LIDAR competitive environment

	Galion	ZephIR	Leosphere	Avent	Pentalum	Windar Photonics
Product name	Galion	Zephir	Windcube	Windiris	Spidar	WindEye
Nationality	UK	UK	France	France	Israel	Denmark
Ownership	SGURR, UK	Natural Power, UK	Leosphere, France	Leosphere, France NRG, US	Cedar, Evergreen, Drager, Jurvetson, Bright Capital, GE, ABB	Various partners, AIM-listed
Estimated price range	c €180k	c €140k	c €150k	c €100k	c €70k	<€25k
Measurement distance	4,000m	300m	300m	250m	200m	80m
Laser type	Pulsed wave	Continuous wave	Pulsed wave	Pulsed wave	Pulsed wave	Continuous wave
Size (mm)	840x660x660	800x400x400	543x552x540	810x540x330	964x1,139x1,183	400x300x200
Weight	85kg	55kg	45kg	67kg	60kg	24kg
Temp range	-15 to +35ºC	-40 to +50ºC	-45 to +50ºC	-30 to +60ºC	-30 to +50ºC	-40 to +55ºC

Source: Windar Photonics, Edison Investment Research

As the price differential is so great, the other systems are used in a different way from Windar's system and are therefore not true competitors. WindEye systems are mounted on individual turbines for the lifetime of the turbine, monitoring incoming wind in real time. Rival systems are used to monitor the difference between actual incoming wind speed and the results generated by the turbine wind sensors over an extended period, and this information is used to recalibrate the wind sensors. In this methodology, one system is used for many turbines, but yaw adjustment is not optimal and power yield is compromised. In practice, many wind farm operators do not use LIDAR technology at all, and rely solely on measurements from traditional, simple wind direction and speed devices mounted behind the turbine.

Management board strengthened on listing

The management board consists of founder and COO Jørgen Korsgaard Jensen, CEO Martin Rambusch and NED Johan Blach Petersen. The board was augmented at the IPO by the appointment of chairman John Weston, the former CEO of BAE Systems (1998-2002), who has subsequently held the position of chairman at a series of early-stage development and commercialisation technology businesses. Simon Barrell was also appointed as senior NED. He is a chartered accountant who brings substantial financial experience, previously as FD of Napier Brown Foods, as well as a NED and chairman of a number of public companies.

Sensitivities

Windar needs to manage a number of sensitivities to achieve its plans to fully commercialise the technology and achieve substantial scale and value:

- **Adoption of dynamic yaw adjustment methodology.** Deployment of Windar's systems is a switch in turbine control methodology and requires widespread understanding of this change in wind farm management processes for significant adoption.
- **Regulatory/policy impact on wind industry.** Wind turbine production and wind farm economics are in many instances driven by regulation and subsidy policies. Windar has therefore created a target database of all operating turbines by operator, type, rating and location, which enables a targeted sales approach where payback times are best. Recent changes in Europe are less significant given that the opportunities in China and the US are so much greater.
- **Supplier base.** Windar outsources production of the majority of components with final assembly and integration testing being undertaken at its operations in Denmark. The cost of these components varies considerably with increased volumes and as such, Windar expects to benefit from reduced unit costs as revenues increase. No single supplier accounts for more than 25% of the group's input costs.
- **Potential litigation.** The termination of the Chinese distribution agreement exposes Windar to the risk of litigation. Management announced in February that it had received legal advice that the distributor's claim of unjustified termination is unsubstantiated.
- **Shareholder post-IPO lock-ins – potential stock overhang.** Shareholders representing approximately 83.6% of issued share capital have undertaken not to dispose of shares until 30 March 2016 and to sell through the Nomad for a further six months after that date.

Valuation

Given the early-stage nature of Windar, we believe that relative peer rating valuation techniques are unsuitable and we have therefore derived a DCF valuation out to 2025 based on a range of possible scenarios. We consider three scenarios dependent on the rate of market penetration:

- **Low scenario:** in our low case, we assume that Windar achieves a conservative level of sales from 2016 onwards based on small market share gains, reaching c 4,400 systems by 2019. Employees increase to 33 by 2019, rising steadily thereafter. Net change in working capital is €3.5m at this stage, while expenditure on capex and investment in technology totals €1.3m.
- **Base/mid scenario:** our base case forecast scenario envisages a quicker yet still modest ramp-up in sales to c 6,100 systems by 2019 based on improved market share gains. Net change in working capital increases to €5.8m in 2019, while expenditure on capex and technology investment rises to €1.9m, reflecting a broader range of turbines supported and more test equipment.
- **High scenario:** given the potentially disruptive nature of the WindEye system, we have modelled an accelerated scenario in which market share gains allow Windar to achieve c 19,000 systems pa by 2019 as a result of higher end-market penetration. Employees increase to 57 by 2019. The net change in working capital increases to €7.9m in 2019, while expenditure on capex and technology investment rises to €3.0m.

Exhibit 8: Forecast market share win rates in Edison DCF scenarios

		2016e	2017e	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e
Retrofit	Low	0.03%	0.15%	0.50%	0.70%	1.00%	1.25%	1.25%	1.25%	1.25%	1.25%
	Mid	0.04%	0.20%	0.64%	1.00%	1.73%	2.00%	2.00%	2.00%	2.00%	2.00%
	High	0.08%	1.00%	2.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
OEM	Low	0.75%	3.00%	3.50%	3.50%	3.50%	4.00%	4.00%	4.00%	4.00%	4.00%
	Mid	1.00%	3.50%	4.00%	4.00%	4.00%	5.00%	5.00%	5.00%	5.00%	5.00%
	High	1.25%	5.00%	10.00%	15.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%

Source Edison Investment Research

Exhibit 8 shows our assumed win rates in each scenario using GWEC market forecast data. Running our financial model assuming an average selling price of <€25k for each of these scenarios, a tax rate of 22% and a discount rate of 40% to reflect the relatively early-stage nature of this technology and a terminal growth rate of 2% gives an indicative value of between £35m and £107m as shown in Exhibit 9, with our forecast base case suggesting an indicative value of £57m under these assumptions. These calculations exclude the impact of any financing activity in FY16, which we model as funded through long-term debt totalling €2.5m (£1.9m).

Exhibit 9: Edison DCF valuation using a range of forecast scenarios

		Low case				Medium case				High case		
		Discount rate				Discount rate				Discount rate		
		30.0%	40.0%	50.0%		30.0%	40.0%	50.0%		30.0%	40.0%	50.0%
Term growth	0.0%	34.5	34.5	34.5	0.0%	82.3	56.1	40.4	0.0%	159.3	106.4	75.2
	1.0%	34.7	34.7	34.7	1.0%	82.6	56.3	40.5	1.0%	159.8	106.7	75.4
	2.0%	34.8	34.8	34.8	2.0%	83.0	56.5	40.6	2.0%	160.4	107.0	75.5
	3.0%	34.9	34.9	34.9	3.0%	83.5	56.7	40.7	3.0%	161.1	107.3	75.7
	4.0%	35.1	35.1	35.1	4.0%	83.9	57.0	40.9	4.0%	161.7	107.6	75.8

Source: Edison Investment Research

The share price has fallen by over 20% since the Admission to AIM at 100p/share and a market cap of £38m, reflecting the delays in market penetration caused by the issues with the former distributor in China. The current market cap (£31m) is substantially below the lower bound of our indicative valuation range. Receipt of further volume orders should act as a catalyst towards our mid-case indicative value of c £57m, which is based on the roll-out modelled in our estimates.

Financials

Noting the problems Windar experienced during FY15 with its distributor in China, our reinstated estimates show significantly lower FY15 revenues than modelled in our March 2015 note. We understand that the decision to sell directly in China is resulting in meaningful engagements with potential customers so the problems appear to be temporary, in effect delaying roll-out by about a year.

Earnings

H115 revenues totalled €0.1m. This was lower than management expectations because of the issues in China and lower than H114 (€0.4m), which benefitted from some sales to customers in China. Administrative expenses (excluding IPO costs which we treat as an exceptional item), increased by 70% year-on-year (€0.7m) as management used funds raised in H214 to invest in personnel and increased sales and marketing activities and to lease a new, larger facility in Copenhagen. Pre-exceptional operating losses widened by € 0.7m to €1.6m.

The January 2016 trading update noted that FY15 revenue will be within the revised revenue guidance of €950k (€1,038k FY14), indicating a modest half-year on half-year ramp-up in unit deliveries as engagement strengthened with both OEMs (new-build sales) and utilities (retrofit sales). The half-year on half-year improvement is the result of a significant increase in activity in

both the European and North American markets following a decision to refocus sales and marketing activities there rather than China. Full year (FY15) sales were broadly evenly distributed between the three regions. Since FY15 revenues are expected to be similar to those for FY14, yet there has been a substantial increase in personnel and sales and marketing costs following the FY14 fundraising activities, we model the pre-exceptional operating loss widening from €1.8m in FY14 to €3.2m in FY15.

Windar received its first volume order during FY15. This order, worth c$0.9m, is from a US utility to retrofit a wind park and is scheduled for delivery in FY16. Management is confident that some of the ongoing trials being carried out by utility customers and wind turbine manufactures will also convert to volume orders, resulting in a substantial increase in revenues from Q216 onwards. Management expects growth in each of the three key markets, as the decision to terminate the agreement with the distributor in China and to start selling directly in the region appears to be working well. Noting the length of time it takes to complete product trials, we take a prudent view with regards to the conversion rate during FY16, giving revenues totalling €6.4m and a small (€0.3m) operating loss. A single additional sale the size of the US order received during FY15 would turn this into a small operating profit. Management expects FY16 revenues to be between €6-9m, so our estimates are very much towards the lower end of this range. Our estimates assume market penetration will ramp up during and beyond the forecast period, so that during FY18 4% of all new turbines installed globally during the year (c 950 units) will be shipped with Windar's LIDAR systems and 0.6% of turbines already installed globally (c 3,200 units) will be retrofitted with Windar's LIDAR systems.

Cash flow and balance sheet

Windar is using the £6m raised at 100p/share from a pre-IPO private and institutional funding round to invest in business development, manufacturing capacity and working capital. Cash reduced by €2.8m to €2.8m during H115 (excluding €0.1m deposits and €0.8m Growth Fund borrowing), reflecting operating losses, a €0.6m rise in inventory and €0.7m reduction in payables. Our model assumes a modest increase in working capital during H215 resulting in an estimated €0.6m cash at end FY15. Our estimates show Windar operating at slightly above EBITDA break-even during FY16. However, the continued investment in R&D (€0.5m capitalised during FY16) and in working capital to support sales growth, is expected to result in a funding gap during the year. Our estimates model this to be €1.3m, financed through long-term debt, though management could opt to factor sales in order to finance working capital requirements if necessary. From FY17, we estimate that the cash generated from operations is more than sufficient to cover the working capital required to support future growth. Longer-term, management intends to distribute 50% of earnings as dividends.

Given the potential funding shortfall, management has decided not to commence paying down the Growth Fund loan, as it has the option not to start repaying this until the loan reaches maturity in June 2020. The loan bears interest at 12%. Management may at any point until the maturity of the loan either repay the loan in part or in full, or initiate an annuity repayment scheme over a four-year period. If an annuity repayment scheme is initiated, the interest rate will be reduced to 8% over the repayment period.

Exhibit 10: Financial summary

€'000	2013	2014	2015e	2016e	2017e	2018e
Year-end 31 December	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS						
Revenue	74	1,039	950	6,436	27,110	62,596
Cost of Sales	(44)	(678)	(683)	(3,289)	(12,828)	(27,459)
Gross Profit	30	361	267	3,146	14,282	35,137
EBITDA	(1,044)	(1,514)	(2,803)	141	10,382	29,962
Operating Profit (before amort. and except.)	(1,358)	(1,841)	(3,235)	(349)	9,742	29,212
Intangible Amortisation	0	0	0	0	0	0
Exceptionals	0	(669)	(217)	0	0	0
Other	0	0	0	0	0	0
Operating Profit	(1,358)	(2,510)	(3,451)	(349)	9,742	29,212
Net Interest	(94)	(175)	238	(100)	(100)	(110)
Profit Before Tax (norm)	(1,451)	(2,015)	(2,996)	(449)	9,642	29,102
Profit Before Tax (FRS 3)	(1,451)	(2,684)	(3,213)	(449)	9,642	29,102
Tax	118	70	130	0	0	(6,403)
Profit After Tax (norm)	(1,333)	(1,945)	(2,866)	(449)	9,642	22,700
Profit After Tax (FRS 3)	(1,333)	(2,614)	(3,083)	(449)	9,642	22,700
Average Number of Shares Outstanding (m)	38.2*	38.2*	38.2*	38.2	38.2	38.2
EPS - normalised (€)	(0.03)	(0.05)	(0.08)	(0.01)	0.25	0.59
EPS - normalised fully diluted (€)	(0.03)	(0.05)	(0.08)	(0.01)	0.25	0.59
EPS - (IFRS) (€)	(0.03)	(0.07)	(0.08)	(0.01)	0.25	0.59
Dividend per share (€)	0.0	0.0	0.0	0.0	0.0	0.3
Gross Margin (%)	40.3	34.7	28.1	48.9	52.7	56.1
EBITDA Margin (%)	N/A	N/A	N/A	2.2	38.3	47.9
Operating Margin (before GW and except.) (%)	N/A	N/A	N/A	N/A	35.9	46.7
BALANCE SHEET						
Fixed Assets	1,285	1,195	1,213	1,223	1,583	2,133
Intangible Assets	1,257	1,148	986	1,016	1,266	1,666
Tangible Assets	17	32	212	192	302	452
Investments	11	15	15	15	15	15
Current Assets	640	6,656	2,556	4,898	14,479	37,379
Stocks	147	248	848	1,448	2,398	3,348
Debtors	239	845	1,045	2,195	3,795	8,295
Cash	249	5,549	649	1,241	8,272	25,722
Other	5	14	14	14	14	14
Current Liabilities	(320)	(1,034)	(374)	(674)	(974)	(1,724)
Creditors	(320)	(1,034)	(374)	(674)	(974)	(1,724)
Short-term borrowings	0	0	0	0	0	0
Long-Term Liabilities	(1,436)	(717)	(717)	(3,217)	(3,217)	(3,217)
Long-term borrowings	0	0	0	(2,500)	(2,500)	(2,500)
Other long-term liabilities	(1,436)	(717)	(717)	(717)	(717)	(717)
Net Assets	170	6,100	2,678	2,230	11,871	34,571
CASH FLOW						
Operating Cash Flow	(1,095)	(2,142)	(4,479)	(1,309)	8,132	25,262
Net Interest	(1)	(175)	(100)	(100)	(100)	(110)
Tax	95	118	130	0	0	(6,403)
Investment in intangible & tangible assets	(8)	(230)	(450)	(500)	(1,000)	(1,300)
Acquisitions/disposals	(55)	0	0	0	0	0
Financing	0	7,071	0	0	0	0
Dividends	0	0	0	0	0	0
Net Cash Flow	(1,064)	4,643	(4,899)	(1,909)	7,032	17,450
Opening net debt/(cash)	(508)	(249)	(5,549)	(649)	1,259	(5,772)
HP finance leases initiated	0	0	0	0	0	0
Other	805	657	0	0	0	0
Closing net debt/(cash)	(249)	(5,549)	(649)	1,259	(5,772)	(23,222)

Source: Edison Investment Research. Note: *On number at Admission to AIM.

Contact details	Revenue by geography
3 More London Riverside London SE1 2AQ UK +45 2055 5599 www.investor.windarphotonics.com	N/A

Management team

CEO: Martin Rambusch	CTO and founder: Jørgen Korsgaard Jensen
Martin Rambusch has worked in the wind turbine industry for more than 18 years. He was the former CEO of Svendborg Brakes, which he sold to the UK private equity firm Doughty Hanson for €460m. Before this he was the CEO of Dansk Synergi. Martin has been involved in several acquisitions and turnarounds of smaller Danish companies.	Jørgen is an expert in optical technology solutions and has been involved in R&D projects in collaboration with DTU for 16 years. He previously held leading positions in international companies across strategy, finance, purchasing and logistics. He is also CEO and founder of OPDI Technologies, which develops and markets intelligent photonic sensors for IT and 'smart' energy solutions, and of O-Net WaveTouch, Hong Kong, which develops and markets optical touch screen technologies. Before this he was the CEO and founder of Karnitech International, CFO of Gram, CFO of Glasuld (Saint Gobain) and CFO of Farre Food.

Chairman: John Weston

John Weston worked in the aerospace and defence industry for 32 years, predominantly with BAE Systems where he ultimately became chief executive, leading a group with $20bn in sales, employing 120,000 people. John's previous chairmanships include Acra Controls, AWS Electronics, Insensys, Inbis, iSOFT, MB Aerospace Holdings, Spirent and Torotrack. He is currently chairman of Fibercore and Accesso Technology Group. He is a VP of the Royal United Services Institute. He has previously served on the council of the Royal Academy of Engineering, and the Prime Minister's council for science and technology. In addition to his CBE, he is also a Commander of the Order of the Pole Star (Sweden) and a freeman of the City of London.

Principal shareholders	(%)
SEED Capital Denmark II K/S	18.5
Jørgen Korsgaard Jensen (Pasinika Sarl, Luxembourg)	18.1
DTU Symbion Innovation A/S	10.9
M.M. 26 Holding A/S	10.6
Aldbridge Services London Ltd	7.1
Danmarks Tekniske Universitet	6.2
Milton Holding Horsens A/S	5.6
Artemis Investment Management LLP	5.2

Companies named in this report

Shanghai Taisheng Wind Power Equipment Co. (300129:SZ)

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