EDISON

PowerHouse Energy Group

Initiation of coverage

Ready, steady, GO

Alternative energy

In August 2013, PowerHouse Energy Group acquired the outstanding stake in Pyromex Holding AG, thus securing control of an ultra-high temperature gasification (UHTG) technology for converting waste material to energy. This technology has been extensively tested and the pilot site is expected to begin commercial operation by the end of FY14, subject to ongoing funding being secured. Cash from gasification operations and the first equipment sales, expected during FY15, will enable the group to expand its gasification capacity. We estimate that 10 50tpd reactors would generate revenues of between $47m and $72m annually from electricity sales, representing $35m to $59m incremental operating profit.

Year end	Revenue (US$m)	PBT* (US$m)	EPS* (c)	DPS (c)	P/E (x)	Yield (%)
12/13	0.0	(1.0)	(0.4)	0.0	N/A	N/A
12/14e	0.0	(1.8)	(0.5)	0.0	N/A	N/A
12/15e	18.3	7.2	1.5	0.0	1.4	N/A
12/16e	27.0	11.1	2.3	0.0	0.9	N/A

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

Capturing structural growth in waste to energy

PowerHouse aims to benefit from regulatory pressure, especially in Europe, for alternatives to landfill for disposing of waste, and rising global demand for electricity as well as the renewables agenda. Since the technology generates electricity from material that would otherwise incur a cost for disposal, the economics do not require it to achieve a comparable production cost per kW to conventional generation systems. In addition, data from management indicates that the technology should be economic without being reliant on green subsidies.

Poised to progress to full commercialisation

PowerHouse has been operating a pilot 25tpd reactor at a third-party waste processing facility in Munich since 2010. This is expected to be recommissioned and start commercial operation by end FY14. A smaller 5tpd unit has been commissioned and tested. The first sales of the smaller units are expected to complete in early FY15. Cash from the Munich gasification operation and equipment sales will enable the group to expand its capacity at the Munich site and then open similar facilities at other waste transfer sites. Key to success will be the management's ability to create a viable organisation to capitalise on the initial interest received.

Valuation: Developing business model, funding key

With opportunities in several countries, PowerHouse has the potential to drive rapid growth subject to appropriate funding being secured. We estimate that c $2.5m of forecast debt at December 2014 has still to be financed. Looking forwards, we estimate that 10 50tpd reactors built, owned and operated by the group would generate $47-72m revenues annually including tipping fees and environmental feed-in tariffs, depending on the feedstock used and wholesale electricity prices. This represents $35m to $59m incremental operating profit.

11 September 2014

Price	**1.25p**
Market cap	**£5m**
	$1.33/€, $1.66/£
Net debt (US$m) December 2013	2.5
Shares in issue	388.5m
Free float	94.0%
Code	PHE
Primary exchange	AIM
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	0.0	(28.6)	(66.7)
Rel (local)	(3.8)	(27.9)	(68.1)
52-week high/low		6.13p	0.75p

Business description

PowerHouse Energy Group is an alternative energy company specialising in the sale of waste to energy systems. It acquired complete control of Pyromex Holding, a developer of novel ultra-high temperature gasification (UHTG) technology, in August 2013.

Next event

AGM	28 August 2014

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Edison profile page

Investment summary

Company description: Making money from waste

PowerHouse Energy owns an innovative waste-to-energy, ultra-high temperature gasification (UHTG) reactor technology. This technology provides a mechanism to dispose of a wide range of waste streams by using them as feedstock that can be converted to synthesis gas (syngas). This in turn can be used to generate electricity for export to the grid or use within an enterprise. Unlike competitive techniques for converting municipal wastes to energy, the reactors do not produce toxic residues and have a small footprint, making them suitable for deployment at enterprise or community level. PowerHouse intends to begin commercial gasification and electricity generation at its 25tpd pilot facility in Munich later this year, double capacity at the site during FY15 and then replicate the expanded facility at other waste transfer sites from FY16 onwards. Having demonstrated the equipment to over 40 potential customers, PowerHouse expects to complete its first equipment sales in early 2015. The legacy issues relating to a false start under previous management have now been resolved, freeing management to focus on growing the business.

The group's waste-to-energy technology satisfies the joint needs of finding an alternative means of waste disposal to landfill or incineration, meeting the continuing rise in demand for energy globally, ensuring security of energy supply and providing a predictable form of green energy to complement intermittent supplies such as wind and solar.

Financials: FY15 is the turning point

Cash from commercial generating activities at the established facility near Munich, which is expected to come on line towards the end of FY14, and the first equipment sales, anticipated in early FY15, are expected to deliver maiden profits for FY15. While the balance sheet is looks weak, with net debt (primarily the Hillgrove convertible note) at $2.5m, and no banking facilities, at end FY13, management reports that Hillgrove has committed to ongoing funding at least through 15 June 2015, while the company continues its external fund-raising activities. The group is dependent on continued support from Hillgrove or successful external fund-raising activities to generate sufficient cash to start commercial electricity generation at the Munich site.

Valuation: Based on build, own, operate model#

Since it is not possible at this point to determine the dilutive impact of the potential conversion of a convertible loan from Hillgrove Investments (a company beneficially owned by the chief executive of Linc Energy, which has an 8% stake in PowerHouse Energy) or an ongoing fund-raising programme, we are not attempting to derive an indicative share price from this analysis. We estimate that 10 50tpd reactors would generate between $47m and $72m revenues annually including tipping fees and environmental feed-in subsidies, depending on the feedstock used and wholesale electricity prices. This represents $35m to $59m incremental operating profit.

Sensitivities: Risk will reduce with commercialisation

Balance sheet issues are noted above. In addition, while both the 5tpd and 25tpd reactors have undergone extensive testing, there is additional risk because the UHTG technology is only on the brink of commercialisation, so there is uncertainty regarding the performance of the reactors in a normal operating environment, the ability to convert the pipeline to sales and to scale up operations to support commercial activities, and their timing. Our estimates and valuation are based on data from the company taken during trials. In common with all companies offering waste-to-energy technologies, PowerHouse Energy will be affected by macroeconomic factors such as the availability of waste, demand for electricity and regulations affecting waste disposal.

Company description: Waste-to-energy technology

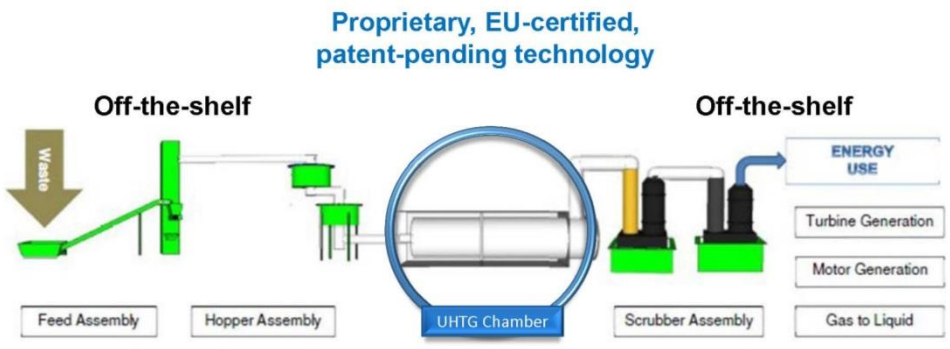
PowerHouse Energy Group owns Pyromex Holding AG, which has developed an innovative waste-to-energy, ultra-high temperature gasification (UHTG) reactor technology. This technology converts any hydrocarbon waste streams including plastic or woody bio-mass into synthesis gas (syngas), which can be used to generate electricity for export to the grid or use within an enterprise. We understand that, since it operates at a higher temperature than conventional gasification techniques, it converts a higher proportion of the energy in the waste to a usable form, emits zero emissions and produces no char or oil residue. Currently two sizes of reactor are available, 5tpd, which is suitable for a single enterprise such as an abattoir, and 25tpd, which is suitable for a community-level waste processing facility. Both types have undergone testing and received environmental certification. They have been demonstrated to over 40 potential customers. By the end of FY14 management expects to have recommissioned the pilot 25tpd facility in Munich (incorporating upgrades identified during testing) and started commercial operation at the site. It expects to deliver the first reactors to customers in early FY15. Cash from the Munich gasification operation supplemented by equipment sales will enable the group to expand its gasification capacity at the Munich site in FY15, and then open similar facilities co-located at other waste transfer sites from FY16 onwards. This activity is intended to provide long-term, stable, recurring revenue streams. Being able to demonstrate commercial operation will in turn encourage reactor sales.

Pyromex is based in Zug, Switzerland, where there are four staff. Its 25tpd reactor, which is expected to begin commercial operation towards end FY14, is located at a waste disposal plant near Munich where the group has a single contractor. Expanding the management team with business development and operations personnel is a high-priority activity as the group moves to commercialise the technology. Several candidates have already been identified.

Technology – Pyromex's ultra-high temperature gasifier

Pyromex's UHT gasification technology is an innovative, patented process that has been developed over the last 15 years. The UHT gasifier uses a process in which complex organic molecules are broken down through indirect heat in an oxygen starved environment into their constituent elements. A typical composition of syngas output is 45% H_2, 45% CO, 7% CH_4 and 3% CO_2. The proportions may be varied once the gasification process is complete in order to produce syngas suitable for different end applications.

Exhibit 1: Pyromex's UHT gasification technology



Source: PowerHouse Energy Group

The individual process steps are:

1. Material with high calorific values, eg tyres, plastics, woody bio-mass, municipal solid waste, and hospital and hazardous waste, is shredded and then separated into recyclable materials and refuse derived fuel (RDF).
2. RDF is passed through the nitrogen purged feed bin system to remove any oxygen.
3. Oxygen-free RDF moves through the rotating ultra-high temperature gasification chamber at atmospheric pressure in a non-combustive environment. The reactor, operating at above 1,000°C, breaks down the RDF, converting it into synthesis gas.
4. The syngas passes out of the reactor and any remaining solids, which are benign, are removed and disposed of according to local environmental compliance requirements.
5. The syngas is used to generate electricity in a gas-powered turbine. An estimated 17% of electricity generated is used to power the UHT gasification system. Any thermal energy created during this step may be used to heat the site. Alternatively, the syngas may be converted to liquid hydrogen, syndiesel or other liquid fuel suitable for transportation or used as a replacement for natural gas or oil for heating or use in industrial furnaces.

It is intended that, when commercially available, the hydrogen component of syngas (up to 75% of total) could be used to generate electricity using fuel cells rather than conventional generation systems. PowerHouse has placed an early order for a Beta+ fuel cell test systems from AFC Energy, a company in which Linc Energy has a 10% stake. The fuel cells are to be used with a test 5tpd reactor to improve the electrical output per volume of gas produced. The initial payment will be £50k, satisfied through the issue of 2.0m new shares. The final payment of £100k will be payable in cash in Q215. AFC Energy considers that the amount of power produced for a given quantity of feedstock can be increased by up to 30% by deploying fuel cells.

Competitive position of technology

Pyromex's UHTG technology is well positioned with respect to other techniques for disposing of waste and recovering the associated energy. We understand that, since it operates at a higher temperature than conventional gasification techniques, it converts a higher proportion of the energy in the waste to a usable form, emits zero emissions and produces no char or oil residue (see Exhibit 2). Moreover, the reactors occupy a relatively small footprint: only 6x13 metres for the 5tpd variant and 25x25m for the 25tpd, making them very suitable for situations where the energy generated is consumed close to source. PowerHouse expects to sell the reactors in pairs to create 10tpd and 50tpd reactors, since twinning reactors is expected to double output without doubling operating expenses or capital expenditure.

Exhibit 2: Competitive waste disposal technologies

Landfill	Incineration	Pyrolysis	Gasification	Plasma Arc	Pyromex UHTG
Low cost, outdated, environmentally undesirable	Limited range of feedstock	Limited range of feedstock	Generally involves combustion	High capex, operation and maintenance costs	90%+ waste to energy conversion
Potential for uncontrolled chemical reactions	Environmentally undesirable	Permanent issues with remaining tar and oils	Produces emissions and char residue	Needs high throughput, energy balance inefficient	Zero emissions, no char or oil residue
Danger to groundwater and the environment	Additional costs due to pollution and toxic ash	Problematic disposal of char residue (toxic)	Moderate waste to gas efficiency	Almost exclusively large scale, large footprint	All waste, compact, modular and scalable

Source: PowerHouse Energy Group

Since Pyromex reactors generate electricity from material that would otherwise incur a tipping fee on disposal, the technology is not dependent on green subsidies to be commercially viable nor does it need to achieve a comparable energy conversion rate to conventional generation systems. Reactor operators will either use the plant to dispose of their waste, which would otherwise incur a cost on disposal, or receive a fee from the third party whose waste they are destroying. Pyromex currently receives a tipping fee of over €60/tonne for the waste it uses as feedstock. It is likely that equipment sales will be made as part of combined waste disposal/energy generation projects. Management has identified over 100 waste transfer stations similar to the Eitting site in Bavaria alone. These will

be the initial target market, as the environmental permits for operation in the state have been secured and the alternative for disposing of the waste, incineration, is €170-200/tonne. Niche operations disposing of medical, pharmaceutical, toxic or hazardous waste materials, where the cost of disposal can reach €1000/tonne will be key targets. Thailand, where the group has an exclusive vendor arrangement with Waste2Tricity and where a 25tpd project has been identified, is another important potential market. Management calculates that the payback period for potential customers ranges from two to four years.

Macro opportunity driven by waste and energy growth

PowerHouse Energy is positioned to take advantage of the growing volumes of waste being produced globally and restrictions, especially in the developing world, regarding its disposal, as well as continuing growth in demand globally for energy.

Although in some developed economies the level of waste produced has been declining in recent years, globally the production of waste is forecast to continue rising. OECD forecasts project an increase in municipal waste of 1.3% pa between 2005 and 2030. This forecast rise in waste output presents environmental challenges, but also a business opportunity for waste-to-energy companies.

As part of the solution to this environmental challenge, we expect there to be a continuation of the trend of reduced landfilling of waste that has already been seen in many European countries. According to the EU Landfill Directive, the amount of biodegradable municipal waste must be reduced to 50% in 2009 and to 35% in 2016 (compared to 1995 levels). In markets where punitive taxes (or outright prohibition as in the case of Switzerland for municipal solid waste) encourage the diversion of waste streams away from landfill, this has led to a search for alternative methods of disposal. This has led to a rise in the level of recycling and incineration. Statistics on municipal waste treatment from Eurostat indicate that Austria recycles and composts 62% of its waste but incinerates 35%, Germany recycles 65% and incinerates 35%, while Belgium achieved a recycling rate of 57% with 35% incineration. Figures for the UK show 46% recycling and composting versus 17% incineration.

Although the calorific content of the waste generated is significant, so far there are relatively few waste disposal facilities where any energy is recovered from the waste. Figures from the 2010 survey of commercial and industrial (C&I) waste produced in England show that while 52% of C&I waste was recycled, re-used or composted, only 2% was incinerated with energy recovery. On a global level, it is estimated that there are c 800 waste-to-energy facilities, around 500 of which are located in Europe.

Rising energy demand globally suggests that the energy locked up in waste should not be overlooked. Estimates from the US Energy Information Administration (EIA) and the International Energy Agency (IEA) suggest long-term growth rates in demand for energy of 1.0-1.5%. Demand for electricity is expected to grow more rapidly than any other form of delivered energy, at an estimated 2.2% (EIA and IEA). However, there are significant regional variations in the projected growth rates, with OECD nations expected to grow more slowly than non-OECD countries.

The method of satisfying the increase in demand for electricity varies, with some countries setting specific quotas for different types of energy production. In Europe, driven by a combination of environmentalism and security of supply concerns, the EU Renewable Energy Directive requires Europe as a whole to meet 20% of its energy requirements from renewable sources by 2020. Therefore, within the growth mix, renewable energy is expected to show a stronger than average rate of growth. According to the IEA, global renewable energy generation is predicted to grow at a CAGR of 5.9% (2012-18), while bioenergy is forecast to grow more rapidly at a compound annual rate of 7.3% over the same period. The conversion of waste to energy is a useful element in the

renewable energy mix since it provides a predictable level of output, offsetting intermittent supplies from wind and solar sources. Moreover the economics of production are different, especially in regions where landfill is expensive or prohibited, since local authorities would otherwise have to pay for the waste to be incinerated or otherwise disposed of. This means that adoption of the Pyromex UHTG technology is not dependent on green subsidies to be commercially viable, nor does it need to achieve an energy conversion rate comparable to conventional generation systems.

Despite some areas of overcapacity in the combustion/incineration of waste (eg the Netherlands), further growth in waste-to-energy markets is expected at a c 12% CAGR globally in the period 2012-16 (source: Frost & Sullivan "Global Waste to Energy Plant Market"). The majority of the expansion is expected to take place in Asia, where China is projected to increase its number of waste-to-energy facilities by more than 100 in the period 2011-15. Growth is also anticipated outside Asia. According to statistics produced by Defra, waste-derived renewable electricity is forecast to grow from the current 1.2TWh, to between 3.1TWh and 3.6TWh by 2020, a growth rate, even in the lower scenario, of over 10% a year.

Executing the strategy

Corporate history

PowerHouse Energy was created through the reverse takeover of AIM-listed BidTimes plc by PowerHouse Energy Inc in April 2011. At that time, PowerHouse Energy consisted of a US business that designed, built and installed combined heat and power systems and had taken a 30% stake in Pyromex with the intention of using its existing channels to manufacture and distribute UHTG reactors in the US and elsewhere. Since it took longer to commercialise the Pyromex technology than was originally envisaged, the group experienced cash flow difficulties. The shares were suspended in April 2012 while sources of funding were secured to enable the group to close down the US operations, acquire the remaining 70% stake in Pyromex and bring the UHTG technology to market. In June 2012 a deal was agreed with Linc Energy (see page 7), under which Linc Energy advanced $250k through the issue of a convertible loan note, Keith Allaun, who had previously worked for Linc Energy as a consultant, was appointed as executive chairman and the previous executive chairman and finance director left. Shares resumed trading in October 2012. After a broad evaluation of both existing and emerging waste-to-energy options, it was decided to focus on the Pyromex opportunity. Since his appointment Keith Allaun has placed the group on a more secure footing, acquiring the outstanding 70% stake in Pyromex and resolving outstanding legacy issues (see 'Resolution of legacy issues', page 7).

Demonstrating the technology

Pyromex has had a 25tpd operational test unit in place at a waste transfer station in Eitting, Munich, since 2010. This has allowed Pyromex to refine the technology to meet the expected operational conditions, to obtain operational performance figures (on which we rely), to gain an understanding of the cost characteristics of the 25tpd unit, and to secure environmental certification in Bavaria, where the local regulations are as stringent as those applied in California. So far we understand that the operation has secured "tipping fees" of €60/tonne for dealing with the waste, and generated an average of 1,000kW (net) each hour, for which it would have received €0.15/kW h, which includes an environmental subsidy, had it been supplied to the grid. Based on current German tariffs, management notes that a price of €0.19/kW may be achievable in future.

Elements of the proven 25tpd reactor were used to design a smaller, 5tpd variant, which is more suitable for operation in an office park or at an enterprise level. The first 5tpd unit was successfully commissioned and tested at Pyromex's Swiss factory during Q413 and received EU safety certification in November 2013.

Poised for first equipment sales in early FY15

Over the past year, more than 40 potential customers have been able to inspect the working reactor in Switzerland. In March this activity resulted in a first letter of intent to purchase a 5tpd reactor. The letter of intent, which is non-binding and conditional on regulatory approvals and financing, is from a Polish group that intends to use the reactor to dispose of medical waste (medical waste is particularly costly to dispose of). Pyromex is currently working with the customer to specify a feedstock preparation sub-system based on off-the-shelf parts and management expects to deliver equipment early in FY15. We note that the sales cycle is typically lengthy because any prospective user needs to ensure a dependable supply of feedstock and secure environmental certification at a local level as well as planning approval.

Resolution of legacy issues

Following the closure of the US operations in early 2012 to conserve cash, the former employees filed legal charges against PowerHouse Energy, which were resolved later that year.

Before PowerHouse Energy secured 100% ownership of Pyromex, RenewMe had been granted exclusive rights by Pyromex to use, own, assemble and install and operate Pyromex systems in the UK, Ireland, India, Scandinavia and the Benelux countries, which are key potential territories for deploying the technology. In order to secure worldwide control over the application, delivery and operation of the UHTG technology, PowerHouse entered into a settlement agreement with RenewMe whereby the latter relinquished its rights to the technology in return for €1.0m, payable in five equal instalments. The first payment was made in June 2011, but not those due in June 2012 or June 2013. The outstanding €800,000 was shown as a liability on the balance sheet in the FY12 and H113 report and accounts. In March 2014, management reached an agreement with RenewMe, agreeing to pay €211,000 in cash (which will be paid from part of the cash raised in the current fund-raising exercise [source: RNS 30 April 2014]) and issuing 18.3m new shares in full and final settlement of the outstanding payment. RenewMe now holds a 5.0% stake in the group.

In June 2012 PowerHouse Energy received a $250,000 convertible loan from Linc Energy, a diversified energy company, which owns a portfolio of coal, oil and gas deposits as well as being a first mover in underground coal gasification technology. The loan was unsecured, and carries interest of 15% per annum and can be converted at any time into shares at a conversion price of 1p/share at the option of the holder. In October 2012, the convertible loan arrangement was transferred from Linc Energy, in which Chief Executive Peter Bond held a 40% stake, to Hillgrove Investments Pty Limited, a company beneficially owned by him, which has a 5.77% stake in the PowerHouse Energy Group. Hillgrove continues to be very supportive. In June 2014, it agreed to extend the term of the convertible loan from October 2014 to October 2015. It also provided a letter of intent, indicating that it would extend the amount loaned under the convertible loan agreement to provide adequate financial support for a period extending to at least June 2015. By February 2014, the amount loaned had increased to £1.4m. Given the increase in available assets following the acquisition of the outstanding stake in Pyromex, in February 2014 Hillgrove was granted a fixed and floating charge over all the property and other assets of PowerHouse. Management notes that Hillgrove has provided verbal assurances to the company that it would be willing to advance further sums of new money to PowerHouse if required. Management notes that the terms of the conversion into shares may be modified so that any potential conversion is not prejudicial to other shareholders.

Previous management arranged a facility of £100,000 with a consortium formed of Aspermont Ltd, Dilato Holdings Pty Ltd and Tesla Nominees Pty Ltd. Although this was originally repayable by May 2012, funds were not available at the time, so the loan incurred interest at a default rate of 7% a month, resulting in £405k owed at March 2014. New management settled this in full in April through the issue of 10.0m new shares at 2.5p/share, representing a substantial discount to the book value of the loan. Prior to this settlement Dilato Holdings had a 7% stake in PowerHouse Energy.

Concurrently with reaching a full and final settlement with Aspermont, shares were issued to certain other creditors. These were PowerHouse Energy Australia, which is owned by third parties, in full and final settlement of a $100k debt, certain creditors of Pyromex AG, which were due £263k in aggregate, and a US provider of a $50k line of credit. Including the shares issued to Aspermont, a total of 19.9m new shares were issued in April in settlement of these outstanding claims.

Management advises that, following the settlement with Aspermont and other creditors, there are now no outstanding creditors other than Hillgrove. Resolution of these legacy issues should free up management to focus on growing the business.

Sensitivities

- **Balance sheet and Hillgrove backing**: PowerHouse Energy has no banking facilities and is therefore totally dependent on Hillgrove Investments, which has provided at least £1.4m funding in the form of a convertible loan, secured against the group's assets. The FY13 report and accounts state that Hillgrove has agreed to continue to provide the funding required to maintain the group as a going concern until at least June 2015. In February 2014, management noted that Hillgrove was prepared to increase the sum loaned, although there is no formalised commitment to do so. We note the potential dilutive impact of the ongoing fund-raising, details of which have not yet been announced, and of the Hillgrove convertible loan if it is converted to shares when the agreement expires in October 2014.
- **Macroeconomic factors affect rate of uptake of waste-to-energy systems:** The pace of economic development will have an impact on the rate at which waste is produced and alternative methods of generating energy are supported. As witnessed in the recession, economic output can have an effect on waste production, with industrial waste volumes decreasing in the UK between 2010 and 2012. Conversely, as traditional sources of energy become increasingly expensive, the adoption of alternative sources of energy becomes economically more attractive.
- **Regulatory impact on waste disposal.** The regulations governing waste disposal are becoming increasingly rigorous. They are governed in the EU by the revised Waste Framework Directive (2008). Article 4 of the directive lays out a hierarchy of techniques for dealing with waste, which are ranked according to environmental impact. Prevention is at the top, followed by re-use, recycling, recovery and ultimately disposal. Policies have evolved to encourage investment further up the hierarchy. For example, progressive increases in landfill taxes are designed to improve support for treatment and recovery technologies and deter the use of landfill. While broadly beneficial for PowerHouse Energy in that legislation makes it more economically attractive for business to use waste to produce energy, potential customers need to demonstrate that the equipment meets local environmental regulations before they are able to start operating the reactors, which could cause delays in closing orders.
- **Technology still at pre-commercial phase**: The Pyromex technology has been developed over the past 15 years. The 25tpd reactor has been in situ since 2010 and the 5tpd reactor went through extensive testing during Q413. Nevertheless neither type of reactor has operated in a fully commercial format. Consequently there is no guarantee that the technology will function as expected when working in a commercial environment. In addition, the metrics used to build up our estimates of BOO revenues and profits have not been proven in a commercial environment and have been scaled up for a 50tpd unit from data derived from a 25tpd reactor. Similarly, there is no record of actual prices paid for 25tpd reactors, the likely cost of production once volume sales are achieved, or the settlement terms for equipment sales.

- **Availability of waste for BOO projects:** Any BOO project will need to secure a steady stream of waste feedstock. It is likely therefore that these projects will be part of combined waste disposal/energy generation complexes, such as that established at the existing Munich site.
- **Scaling up organisation**: At present staffing levels have been kept to a minimum to conserve cash until the technology reaches the commercial phase. Once this is reached, the group will need to expand, for example recruiting dedicated sales personnel, in order to maximise the potential of the technology. There is also some risk associated with managing this process to ensure that revenues and costs are aligned without impeding revenue development.

Valuation

We have created a number of scenarios for revenues and incremental profits that would be generated from multiple 50tpd reactors. These would be built, owned and operated by PowerHouse Energy and co-located at third-party waste transfer sites. The base case uses historic tipping fees (€60/tonne), rates of electricity generation (1.0MW average net) and tariffs for electricity generation (€0.15/kW). The "mid" case is similar to the base case except it assumes a fee for electricity generation that is towards the upper bound expected by management (€0.19/kw) and tipping rates of €90/tonne, which is less than current disposal rates in Bavaria of over €170/tonne. The "high" case is similar to the "mid" case, except it is based on using waste tyres as the feedstock. These have a calorific value that is 1.2x higher than the feedstock currently used.

Exhibit 3: Scenario analysis, build, own, operate model

Number of 50tpd generators	1	2	3	4	5	6	7	8	9	10
Base case										
Annual revenues $k	4,740	9,480	14,220	18,961	23,701	28,441	33,181	37,921	42,661	47,402
Annual operating profit $k excluding central costs	3,471	6,943	10,414	13,885	17,356	20,828	24,299	27,770	31,242	34,713
Mid										
Annual revenues $k	6,330	12,659	18,989	25,318	31,648	37,977	44,307	50,636	56,966	63,295
Annual operating profit $k excluding central costs	5,061	10,121	15,182	20,243	25,303	30,364	35,424	40,485	45,546	50,606
High										
Annual revenues $k	7,177	14,354	21,531	28,709	35,886	43,063	50,240	57,417	64,594	71,772
Annual operating profit $k excluding central costs	5,908	11,817	17,725	23,633	29,541	35,450	41,358	47,266	53,175	59,083

Source: PowerHouse Energy Group

The outcome of the three scenarios provides a potential guide for the opportunity available to the group. We note that at this stage the different scenarios are based on data collected during trials of a 25tpd reactor, rather than a 50tpd reactor in normal operation, and that the waste/electricity conversion rate for tyres is derived from modelling the calorific value of the feedstock rather than testing it in a UHTG reactor. Since it is not possible at this point to determine the dilutive impact of the potential conversion of the Hillgrove's loan or the ongoing fund-raising programme, we are not attempting to derive an indicative share price from this analysis.

Financials: Scaling up to generate cash

P&L

The key event during FY13 was the acquisition of Pyromex. As this was still at a pre-commercial phase, revenues were negligible and the group reported $1.0m pre-tax losses. Noting the recent letter of intent to purchase and high levels of customer demonstrations over the last nine months, our estimates model the first reactor sales in early FY15. Following company guidance, we model sales of two 5tpd reactors and one 50tpd unit in FY15, and two 50tpd units in FY16, using proposed sales price and cost price data provided by management. We note significant upside if unit sales exceed this level (see Exhibit 4). No adjustment has been made for a potential reduction in cost by

transferring production from Switzerland to a low labour cost region medium term, or for manufacturing in volume. Management intends to begin commercial generating activities at the Munich site by the end of FY14. This reactor is expected to initially have an output capacity of 1.0MW and will generate revenues from tipping fees (€60/tonne) and electricity sales (€0.15/kW). The reactor capacity is expected to be doubled to 50tpd by the end of H115. A further 50tpd reactor operated by the group is expected to come on line in mid-FY16.

Exhibit 4: Sensitivity analysis with respect to number of reactors sold per year

Sales of 10 tpd reactors	1	2	2	3	3
Sales of 50 tpd reactors	0	0	1	1	2
Revenues from equipment sales ($m)	4.8	9.6	19.6	24.4	34.3
Gross profit from equipment sales ($m)	2.7	5.4	9.3	12.0	16.0

Source: PowerHouse Energy Group

Until the group completes its first equipment sales, expected in H115, management will continue to keep operating costs low in order to conserve cash. Our estimates assume that operating costs will remain at post-acquisition levels during FY14 and FY15, with the exception of costs associated with a dedicated salesperson in FY15. On this basis, we expect the group to generate an operating loss of $1.5m in FY14, and maiden operating profit of $7.4m in FY15. Interest charges are expected to fall in FY14, following the settlement of the Aspermont loan in April 2014. We assume that there are sufficient losses to bring forward to eliminate any cash tax charges in the forecast period. We model the dilutive impact of the Pyromex acquisition, the RenewMe settlement and the new shares issued as settlement with Aspermont and other creditors in April 2014 but not the potential conversion of the convertible loan from Hillgrove or the ongoing fund-raising activity.

Cash flow

Under the contracts for building the first two 5tpd reactors, no payment will be required until the reactors have been sold. Customers purchasing subsequent reactors will be required to make staged upfront payments in order to minimise net cash consumption. Working capital requirements throughout the forecast period are consequently expected to be light. We model $0.9m capital expenditure during FY14 to cover recommissioning the Munich facility; $1.5m in FY15 to cover upgrading the facility from 25tpd to 50tpd and the balancing payment for the fuel cell test systems in FY15; and $10.1m in FY16 to cover two 50tpd reactors operated by the group, one of which is expected to start electricity generation mid-FY16, the other in FY17.

Although the group cut back expenditure during FY12, including the US operation, cash consumption during FY13 was significant because of the $0.8m expended on acquiring the outstanding 70% stake in Pyromex and $0.4m on servicing the Aspermont loan. Cash outflow during FY14 will include the settlement payment to RenewMe, of which €211k was payable in cash. Our model shows interest payable to Hillgrove being added to the principal, with the loan being repaid in full during FY15, funded by cash generated from equipment sales and the Munich waste-to-energy facility. We exclude any cash inflow attributable to equity fund-raising.

Balance sheet

The balance sheet at end FY13 showed net liabilities of $2.6m, which included $1.2m owed to RenewMe, $0.6m owed to Aspermont and a $2.0m loan from Hillgrove. Current liabilities exceeded current assets by $5.4m. This situation will have been substantially improved by the settlement with RenewMe in February and other creditors including Aspermont in April. Our forecast at December 2014 is for net current liabilities of $5.8m and net debt of $4.5m, which is $2.5m in excess of the Hillgrove loan at December 2013, implying that additional financing is required. By December 2015 we forecast net current assets of $0.3m and net cash of $0.9m.

Exhibit 5: Financial summary

Year end 31 December	2012	2013	2014e	2015e	2016e
$000s					
PROFIT & LOSS					
Revenue	20	3	0	18,313	27,027
Cost of Sales	0	(47)	0	(8,099)	(11,950)
Gross Profit	20	(43)	0	10,214	15,077
EBITDA	(451)	(657)	(1,225)	7,810	11,874
Operating Profit (pre amort. of acq intangibles & SBP)	(575)	(658)	(1,491)	7,385	11,084
Amortisation of acquired intangibles	0	0	0	0	0
Share-based payments	0	0	0	0	0
Exceptionals	(1,433)	0	0	0	0
Operating Profit	(2,007)	(658)	(1,491)	7,385	11,084
Net Interest	(210)	(387)	(316)	(176)	0
Profit Before Tax (norm)	(785)	(1,044)	(1,807)	7,209	11,084
Profit Before Tax (FRS 3)	(2,218)	(1,044)	(1,807)	7,209	11,084
Tax	11	0	0	(1,442)	(2,217)
Profit After Tax (norm)	(774)	(1,044)	(1,807)	5,767	8,867
Profit After Tax (FRS 3)	(2,207)	(1,044)	(1,807)	5,767	8,867
Average Number of Shares Outstanding (m)	285.1	285.4	379.1	388.5	388.5
EPS - normalised (c)	(0.140)	(0.366)	(0.477)	1.485	2.282
EPS - normalised fully diluted (c)	(0.140)	(0.366)	(0.477)	1.485	2.282
EPS - FRS 3 (c)	(0.208)	(0.422)	(0.477)	1.485	2.282
Dividend per share (c)	0.00	0.00	0.00	0.00	0.00
Gross Margin (%)	N/A	N/A	N/A	55.8	55.8
EBITDA Margin (%)	N/A	N/A	N/A	42.6	43.9
Operating Margin (before GW and except.) (%)	N/A	N/A	N/A	40.3	41.0
BALANCE SHEET					
Fixed Assets	1	2,752	3,499	4,568	13,829
Intangible Assets	0	2,087	2,087	2,087	2,087
Tangible Assets	1	665	1,412	2,481	11,742
Current Assets	15	124	(2,178)	1,054	2,277
Stocks	0	0	0	50	100
Debtors	4	54	54	104	154
Cash	11	70	0	900	2,023
Current Liabilities	(2,005)	(5,517)	(3,684)	(776)	(176)
Creditors including tax, social security and provisions	(1,603)	(2,975)	(1,376)	(776)	(176)
Short term borrowings	(401)	(2,542)	(4,540)	0	0
Long Term Liabilities	(313)	0	0	0	0
Long term borrowings	(313)	0	0	0	0
Other long term liabilities	0	0	0	0	0
Net Assets	(2,302)	(2,641)	(2,363)	4,846	15,930
CASH FLOW					
Operating Cash Flow	(893)	344	(1,455)	7,110	11,174
Net Interest	(210)	(387)	0	0	0
Tax	(1)	0	0	0	0
Capital expenditure	0	0	(929)	(1,494)	(10,051)
Capitalised product development	0	0	0	0	0
Acquisitions/disposals	(8)	(757)	0	0	0
Equity financing	112	0	83	0	0
Dividends	0	0	0	0	0
Net Cash Flow	(1,001)	(800)	(2,302)	5,616	1,123
Opening net debt/(cash)	53	703	2,472	4,540	(900)
Net loans (repaid)/received	(627)	(864)	0	2,484	0
Other	277	1,833	(234)	(2,308)	0
Closing net debt/(cash)	703	2,472	4,540	(900)	(2,023)

Source: PowerHouse Energy Group, Edison Investment Research

EDISON

Contact details	Revenue by geography
Level 3 8 Cavendish Square London W1G 0PD UK +44 (0) 20 7079 4407 www.powerhouseenergy.net	N/A

CAGR metrics		Profitability metrics		Balance sheet metrics		Sensitivities evaluation	
EPS 11-16e	N/A	ROCE 13	N/A	Gearing 13	N/A	Litigation/regulatory	●
EPS 13-16e	N/A	Avg ROCE 11-16e	N/A	Interest cover 13	N/A	Pensions	○
EBITDA 11-16e	N/A	ROE 13	N/A	CA/CL 13	N/A	Currency	◖
EBITDA 11-16e	N/A	Gross margin 13	N/A	Stock days 13	N/A	Stock overhang	●
Sales 11-16e	N/A	Operating margin 13	N/A	Debtor days 13	N/A	Interest rates	○
Sales 13-16e	N/A	Gr mgn / Op mgn 13	N/A	Creditor days 13	N/A	Oil/commodity prices	◖

Management team

Executive Chairman: Keith Allaun

Mr Allaun has a background in venture capital, management consulting and executive management. He has worked with leading companies in emerging technologies for over 25 years, including Linc Energy, Apple, Yahoo, Amazon and Hewlett-Packard. He was educated at Stanford University in Palo Alto, California.

Non-executive director: James Greenstreet

Having started his career at Arthur Andersen, Mr Greenstreet joined BAE Systems in 1994 to work in the corporate finance team. There he worked on asset financing, lease transactions and M&A transactions. After leaving BAE he held corporate finance positions at IBM and XL Capital, once more focusing on asset and lease finance. In 2001 he co-founded Orbis Capital, a successful corporate and structured finance business.

Non-executive director: Brent Fitzpatrick

Mr Fitzpatrick has over 20 years' experience as a corporate finance consultant, advising companies on their acquisitions and subsequent flotations. He was formerly non-executive chairman of AIM-listed Global Marine Energy. He is currently also an adviser to ECO Capital, a global clean tech fund, and is a member of the Audit Committee Institute.

Principal shareholders	(%)
Peter Jeney (founder and CEO of Pyromex)	15.5%
David Moard (co-founder and former CEO of PowerHouse Energy Group)	14.9%
Roy Nominees Limited Des: 441960	8.4%
Dilato Holdings Pty Limited	7.7%
Linc Energy Limited	7.3%
Thomas McMahon (cofounder and former Senior VP of PowerHouse Energy Group)	6.8%
Hillgrove Investments Pty Limited	5.1%
RenewMe Limited	4.7%

Companies named in this report

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