



# IMPACT REPORT

## SOCIAL STOCK EXCHANGE 2015

141516



*ITM Power's Wind-Hydrogen refuelling station, opened in September 2015 for public access  
in South Yorkshire, M1 Junction 33*

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## ABOUT THE SOCIAL STOCK EXCHANGE

The Social Stock Exchange (SSE) started its operational life in June 2013, when the platform launch was officially announced by the UK Prime Minister at the first G8 Social Impact Investment Forum in London. Twelve founder members joined the SSX at this time, of which ITM Power plc was one.

The Social Stock Exchange launched as an information platform for investors seeking to access impact opportunities on the public markets. Through its platform, member companies have the opportunity to articulate and evidence their social and environmental credentials through the production of an independently assessed Impact Report.

Published in October 2015

# SHAPING A RENEWABLE HYDROGEN FUTURE

In a world in which fossil fuel energy is becoming ever more scarce and expensive and countries are struggling to meet their carbon reduction obligations, hydrogen solutions have finally reached the top of energy agendas.

ITM Power manufactures integrated hydrogen energy solutions that are rapid response and high pressure that meet the requirements for grid balancing and energy storage services, and for the production of clean fuel for transport, renewable heat and chemicals. The international demand for these solutions is increasing.

- Energy storage provision has started to become a mandatory requirement in areas of the world such as California; it is recognised as an essential prerequisite for renewable energy deployment

- Grid balancing and rapid response demand-side services are crucial for the integration of high proportions of renewable energy supply on the electricity grid
- Auto OEMs are rolling out Fuel Cell Electric Vehicles (FCEVs) that require a high purity hydrogen fuel. Hyundai and Toyota have now commenced production with Honda to follow in 2016. Hydrogen fuel cell cars are now being sold. Global hydrogen refuelling station infrastructure programmes are underway
- Air quality regulations are stimulating the need for hydrogen as a clean fuel for clean transport emissions, in city regions around the world
- Energy security and fuel security has risen to the top of the geo-political agenda
- Price volatility of fossil fuels is driving an industrial substitution to more sustainable chemical processes

## SUMMARY

ITM Power designs and manufactures integrated hydrogen energy systems for energy storage and clean fuel production. The Company has a suite of product platforms based on Proton Exchange Membrane (PEM) technology tailored to the requirements of its target markets. Of particular importance is the ability to respond rapidly and to generate hydrogen at a pressure, flow rate and purity appropriate to its application. The over arching principle is the capacity to take excess energy from the power network, convert it into hydrogen and deliver it either into a vehicle as a clean fuel or the natural gas network as part of a Power-to-Gas energy storage scheme.

ITM Power has developed innovative products, which utilise its technology and know-how to meet the growing demand for clean fuel and energy storage. The Company's business model is centred on growth of sales.

The Power-to-Gas model is a commercial proposition which offers utility companies energy storage options of a scale and duration relevant to the challenges presented by growing deployment of renewable power generation. The equipment provides grid balancing services which consumes excess energy in the power network converting it to hydrogen for injection into the gas network. There are structured payments for both grid balancing services and supply of hydrogen which helps decarbonise the gas network. ITM enjoys a unique position having supplied the world's first PEM Power-to-Gas electrolyser in 2013 and which continues to inject hydrogen into the German gas distribution network. ITM has supplied a second PEM Power-to-Gas system to RWE in the year.

The refuelling model is one that incorporates the work of national hydrogen infrastructure initiatives to support the growth of hydrogen

as a transport fuel, both for use in cars and buses initially, and with further transport applications in the future. Automotive OEM's have invested billions of pounds developing fuel cell electric vehicles and their roll-out is underway, led by Hyundai and closely followed by Toyota. ITM Power has won contracts to supply on-site hydrogen generation equipment for refuelling in both the UK and California. In the year ITM has achieved awards for two new hydrogen refuelling stations in London plus upgrades to a further four. Opportunities for ITM Power continue to develop in California where it has been legislated that 33% of all dispensed hydrogen fuel is required to be from renewable sources. ITM Power is also an active participant of hydrogen mobility initiatives in the UK, France and California.

A developing tertiary application area for the technology is the production of renewable chemicals such as fertiliser through use of renewable energy to decarbonise the generation process and provide routes for its use in remote areas. Collaborative work in this field has begun and an electrolyser system for such a programme will be delivered during 2015.

At the heart of all of these applications is an ITM electrolyser system.

## GRANT FUNDING

ITM Power utilises funding from grant bodies to contribute towards technological advancement in support of product improvement and cost reduction. Such funding can also support the build, deployment and operation of pilot projects. The funding received from the Innovate UK (formerly the Technology Strategy Board) and EU has enabled an acceleration of development to drive the Company's innovative technology into these rapidly growing markets.

## GLOBAL MARKETS

Markets for water electrolysis as a hydrogen infrastructure solution continue

to develop in the UK, as showcased by the Island Hydrogen, and HyFive projects together with the UK H<sub>2</sub>Mobility initiative supported by the Office of Low Emission Vehicles. Similar initiatives are also underway in France, Denmark, Germany, Japan and the US. The market for Power-to-Gas is led by Germany where ITM Power have sold the first two systems to inject hydrogen into the German distribution network. The opportunities continue to grow rapidly in Germany while spreading to other regions, for example California where energy storage is now mandated.

ITM has a model of locating agents in key territories to position ITM Power as a world leading developer and supplier of electrolyser products. Initial market opportunities often begin with collaborative projects with blue chip companies before leading to sales and maintenance contracts of established, CE marked units. ITM Power has five business development personnel 'in the field', and has also established a strong after sales support team. Business development effort is focused in areas where markets are more advanced. ITM Power has subsidiaries in Germany, California and Denmark which serve to generate local knowledge and partnerships, grow operation and after sales support, increase opportunities for state grant funding, and provide opportunities to operate within the local currency.

## PROFITABILITY

ITM Power sees its route to product and maintenance sales and profitability through the increasing deployment of its products in the key Power-to-Gas energy storage and clean fuel sectors. The Company is well represented in these commercial sectors and territories where market growth is now accelerating. The Company has an established product platform which continues to benefit from ongoing cost reduction activities and technology improvements.

1.0

# CEO OVERVIEW

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“Membership of the Social Stock Exchange isn’t just about wearing a badge, it’s about a commitment to a declaration of the social and environmental impact of a company’s products and operations. It’s also about substance – good environmental performance underlies good business. ITM Power recognise the value of scrutiny that the Social Stock Exchange exercises over its business through the publication and dissemination of the Impact Report, and its importance for investor confidence.”

Graham Cooley  
CEO, ITM Power plc

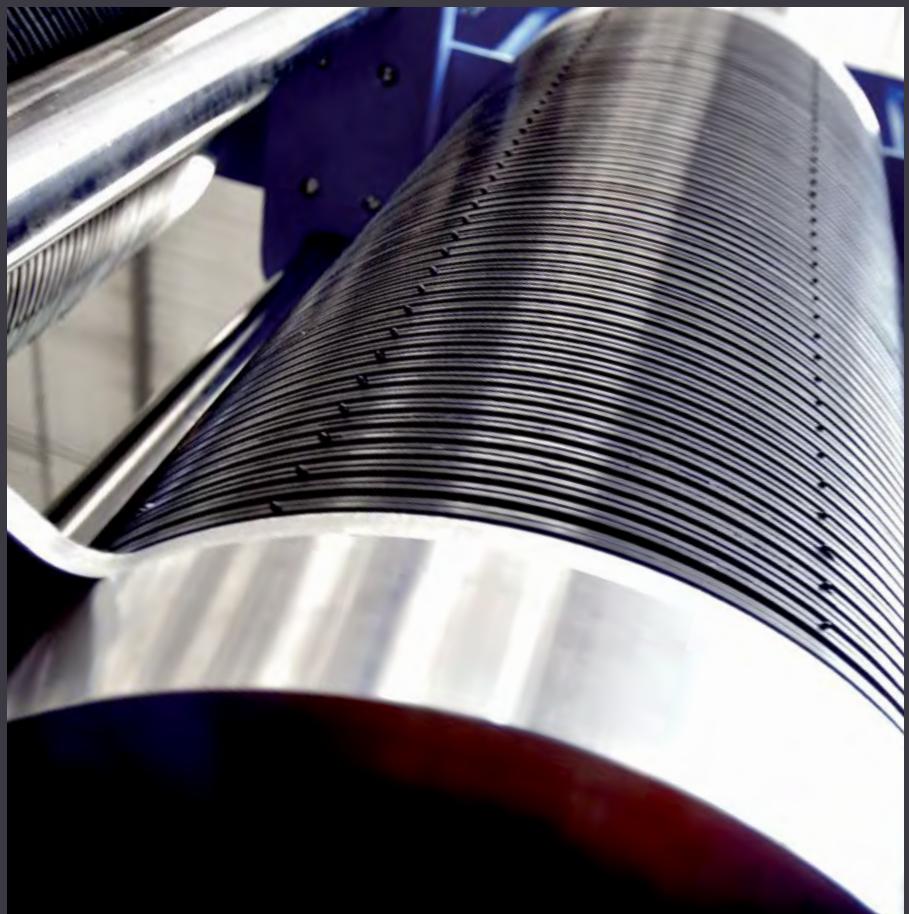
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## 1.1 IMPACT DELIVERED

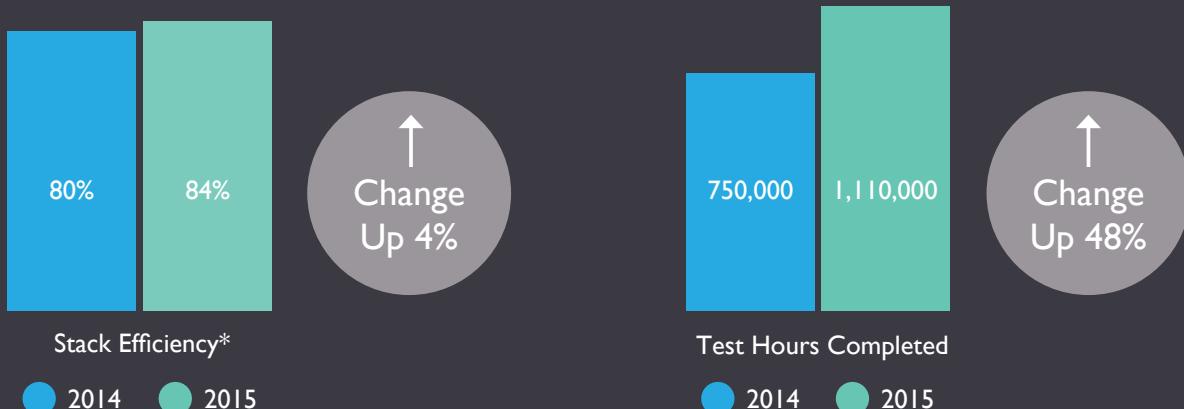
The past year has been a very busy time for the company. Customer engagement with our energy storage and grid balancing products and with our hydrogen refuellers is at an all-time high. The project and quotation pipeline as a result has been steadily growing in both applications. ITM Power enjoys a strong foothold in Germany with its PEM Power-to-Gas technology and is building a valuable portfolio of refuelling stations in the UK centred on London, which will provide strong commercial experience in the manufacture, deployment and operation of hydrogen refuelling stations. This continued progress is a reflection of the skill and commitment of our highly talented team.

## 1.2 IMPACT MANAGEMENT

ITM Power has continued to publish non-financial Key Performance Indicators in its Annual Report, providing stakeholders with a year-on-year comparison of its stack efficiency, operational durability (indicated by Test hours), and cumulative hydrogen production capacity of its installed products, world-wide. This has a bearing on the environmental performance of ITM Power's products portraying ITM Power's contribution to the growing global markets for energy storage and clean fuel, in carbon reduction. Unless stated, this report is based on data reported in the 2014 financial year, ending April 30 2015.

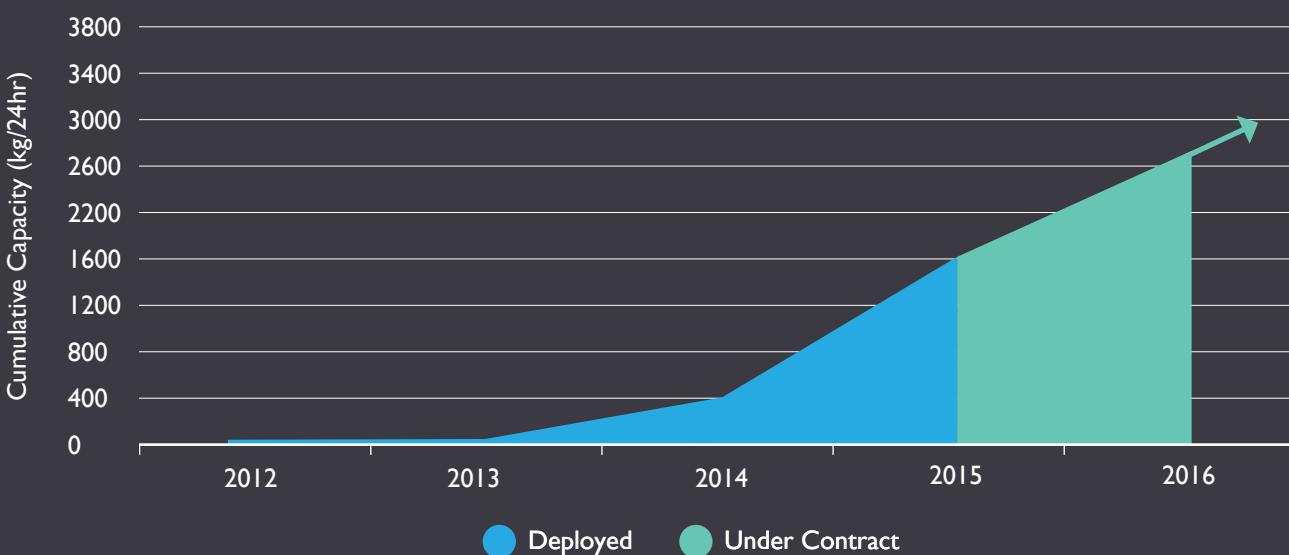


## NON-FINANCIAL KEY PERFORMANCE INDICATORS



\*The efficiency of an electrolyser stack is a measure of the electrical energy input against the chemical energy content of the hydrogen produced.

## HYDROGEN PRODUCTION CAPACITY UNDER CONTRACT IN KW



The Company has achieved an overall efficiency improvement to its rapid response stack platform, to greater than 84% (2014: 80%). This was recorded from plant in the field and represents a real-world reference which can be showcased and repeated. This will provide further significant benefit to end users and will produce a positive impact on the economics of both hydrogen refuelling and Power-to-Gas applications.

The level of knowledge gained within stack development has increased with longevity testing and cyclic testing all contributing to a total of 1,110,000 hours assembled knowledge. This testing has enabled rapid scale-up to date as demonstrated by the largest stack capacity compared with that of prior years.

## 1.3 CHANGES SINCE THE PREVIOUS YEAR'S IMPACT REPORT

In the past year, ITM Power has engaged, led and supported a number of initiatives to address climate change in each of its energy storage & clean fuel sector applications, promoting the use and integration of renewable energy supply. This has been achieved through the successful completion of feasibility studies; the development and award of EU and UK grant collaborative demonstration projects, and sales, notably of systems to RWE in Ibbenbüren, Germany and to EMEC in Orkney.

This year has seen important announcements made by ITM Power's Clients in Germany, notably the Thüga Group, and latterly RWE (August 2015), explaining the virtues of the world's first Power-to-Gas projects using rapid response electrolyzers. Client reference is made to the technical capability, operating performance and high system efficiencies experienced through the deployment and operation of ITM Power's rapid response electrolyser systems. ITM Power's client referenced plants serve to educate and inform policy makers, the market, the media and public on the potential of ITM Power's products.

ITM Power is now firmly focused on large scale solutions. The current strategy is to build on the client accolades, using the existing operational Thüga and RWE projects as reference plant for Power-to-Gas sales. The facility at Thüga Group's Power-to-Gas facility in Frankfurt has a visitor centre for hosting policy makers, utility companies, the media and wider market and stakeholder dissemination. This has been extremely busy with visitors from around the world this past year.

Using the same electrolyser platform, the company is now able (since September 2015) to demonstrate hydrogen refuelling using its facility on the M1, Junction 33, South Yorkshire. Further plant is in final stages of commissioning for operation in California and London, which will be used as reference plant for refuelling station sales and public engagement.

In the medium term, the national hydrogen mobility programmes, in which ITM Power has positioned itself as a key partner for refuelling through electrolysis, will drive initial refuelling station sales, and enable "well-to-wheel" carbon reduction and clean emissions in passenger transport.



## 1.4 OPPORTUNITIES AND RISKS

The Board of Directors meet regularly to review specific and general risks that face the Company and strives to position the Group and Company in a way that any risks can be minimised and met, should the need arise.

Description	Impact	Assessment of change in risk year-on-year	Mitigation
ITM does not achieve sufficient commercial success before existing competitors or new entrants.	The current plans the Company has may not be realised, and ultimately the Company may have to re-evaluate its forecasts.	There is greater commercial traction in the current year, both for ITM Power and some of its' competitors. However, ITM Power has experience in the field that is unparalleled. As such this is considered reduced risk year on year.	ITM Power retains a comprehensive patent suite incorporating novel technologies and processes. The Board considers the patent suite owned by the Group creates a significant barrier to entry for new competitors, and for existing competitors to threaten the Group's market position.
Alternative technologies are adopted in preference to the Group's technology.	The Company could struggle to gain market share or may find itself operating in a smaller market than is currently anticipated.	This risk is considered diminished as the market continues to develop and greater applications are explored and considered feasible.	The Board considers the technological proposition of the Group and through both review and strong targeting considers the technology to be superior to that currently on the market. Through targeted improvements in technology development the board seeks to retain that competitive advantage.
Energy policy changes could adversely affect the commercial and project traction the Group has started to achieve.	The Company may find the technological demand for their product reduced.	This risk is considered diminished compared to previous years as the hydrogen agenda gathers pace. ITM Power's more global positioning decreases the reliance on one particular country's policies.	The board seeks to be led by commentators and industrial bodies as to the direction of policy change. Currently, as global markets continue to rely ever-more-heavily on the use of intermittent and fluctuating renewable energy sources, the case for energy storage solutions continues to be strong.
Regulatory changes could adversely affect the commercial success of the Group.	As the market for hydrogen systems develops, the regulatory structure gains sophistication. The risk of falling behind developments could render products obsolete.	Similar to previous years.	The Board considers regulatory issues, and particularly in the markets for automotive and energy storage solutions find regulations continue to support the case for hydrogen energy systems as a solution. The regulatory environment in which ITM Power operates continues to evolve and the board seeks to position ITM as a leading expert in the field to shape and reliably inform best practice with regards to regulatory changes.
ITM continues to be in a cash consumption phase.	There is a risk that the company may face working capital and cash flow challenges associated with this characteristic and the 'lumpiness' of orders.	At year end there was less cash in the bank than in the prior year but equally there was greater sales traction. ITM Power is also being required to quote for larger systems. This risk has increased slightly.	There are a number of options available to the Group, which include structuring sales beneficially, and requiring money up front. There is an ongoing scheme of work to create greater profitability within the products.

2.0

# SOCIAL PURPOSE AND CONTEXT

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“I believe that water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly or together, will furnish an inexhaustible source of heat and light, of an intensity of which coal is not capable.”

Jules Verne  
The Mysterious Island, 1874

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## 2.0 SOCIAL PURPOSE AND CONTEXT

The production of carbon dioxide is the leading contributor to climate change which is likely to cause economic and social upheaval if left unchecked.

Energy and transportation are the two largest greenhouse gas polluting sectors globally and ITM Power's electrolyser systems that produce hydrogen using renewable energy, can be used to decarbonise both sectors.

When hydrogen gas is generated using renewable energy sources to split water into hydrogen and oxygen by electrolysis, it is a 'triple zero-carbon' fuel, i.e. no carbon is released in the generation, transportation or use of the fuel.

ITM Power's technology completes the circle of energy harvesting and utilisation. All over the world wind turbines are 'constrained off' national power grids (so effectively unable to contribute to the grid), penalty payments are made and the energy wasted. Using electrolysis technology, 100% of surplus renewable energy (that would otherwise be wasted due to the mismatch in supply and demand) can be harvested and converted into hydrogen gas (an energy vector and store of energy). Once created, the gas can be pumped into the gas grid as hydrogen or mixed with captured carbon dioxide to make synthetic methane before being injected into the existing gas grid.

When pumped into the gas grid the stored energy can be used at the 'high pressure energy generation level', in gas turbine power plants, or in the 'low pressure' gas grid, for consumer applications.

The gas can also be stored and used as a transport fuel in hydrogen vehicles (combustion and fuel cell electric vehicles). Replacing hydrocarbon fossil fuels with hydrogen will also contribute to air quality. Most large cities in Europe are in breach of EU air quality legislation and it tends to be poorer communities that suffer with the worst air quality in industrial areas and residential areas with severe traffic congestion. Using hydrogen as a transport fuel will significantly reduce air pollution, eliminating NOx, SOx, particulate and well as carbon emissions.

Finally replacing hydrocarbon fossil fuels with hydrogen (made using surplus renewable energy) will reduce the social and economic pressures arising from declining fossil fuel production as existing accessible reserves are exhausted, and reliance on volatile world energy markets increase; key to promoting a sustainable economy and energy security.

### OUR KEY SOCIAL GOALS ARE THEREFORE TO REPLACE FOSSIL FUEL WITH A VIEW TO:

- Create a zero-carbon economy
- Enhance energy security and sustainability
- Enhance food security and sustainability
- Improve air quality

### **The key products we use to contribute to our goals are:**

- PEM electrolyser systems. We design and manufacture products that create hydrogen from renewable electricity, converting electrical energy into chemical energy.
- Hydrogen storage and dispensing systems. We manufacture units that can produce, store and dispense hydrogen to the consumer
- Our products are systems designed to integrate with existing and smart energy and communication infrastructure

### **There are two main mechanisms by which we aim to achieve our impact:**

1. Transforming transport through;
  - a. Deployment of ITM Power's hydrogen refuelling station based on a green hydrogen production
  - b. Supporting the deployment of hydrogen vehicles (both fuel cell and combustion-based)
2. Power-to-Gas: Transforming energy through electricity grid load-balancing to enable full utilisation of electricity supply from intermittent renewable generation. Converting surplus electrons to hydrogen an energy vector that can be stored for long periods of time in the gas distribution grid, or chemically combined with waste carbon, or nitrogen.

# 3.0

# WHO BENEFITS?

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“This technology was invented in the UK and London already has a massive research base around hydrogen and alternative fuels. When you also consider that we already export thousands of vehicles from the UK that adds up to a big opportunity for many new jobs working in cutting edge new technologies. We are doing everything we can to ensure London is ready when the very first commercially available hydrogen vehicles begin to come to the market in 2015.”

Kit Malthouse  
**Deputy Mayor of London  
for Business and Enterprise**

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### 3.0 WHO BENEFITS?

**The beneficiaries of the deployment of ITM Power's technology are manifold, and in particular:**

#### NATION STATES

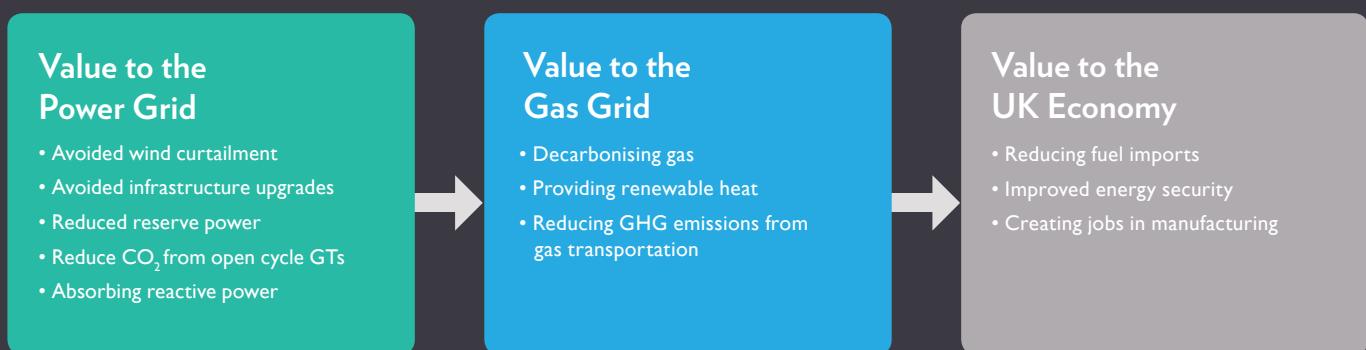
Fuel security and price volatility is a major issue for the governments of countries that do not have the luxury of an indigenous fossil fuel source. Many states now rely upon imported fuel, mainly natural gas, which crosses several national borders and often through politically unstable regions. This, together with the growing deployment of intermittent renewable energy sources and simultaneous decrease in fossil fuel energy generation is destabilising many energy systems. Having the ability to harvest the maximum amount of renewable energy and store it as a clean fuel in the national gas grid can help to overcome these issues.

#### INDUSTRY

Fluctuations of supply and demand, in the energy generation and distribution system causes significant inefficiency, and increases the emission of greenhouse gases. Use of ITM Power's electrolysis technology as a grid balancing tool, offering frequency control by demand side management services, can increase the overall efficiency of the whole energy network, stabilising and reducing energy prices and enabling increased penetration of renewable energy supply capacity on the grid.

The concept of Power-to-Gas shows how a high capacity of renewable energy can decarbonise the gas and heat as well as electricity supply.

#### POWER-TO-GAS – ELEMENTS OF VALUE



GTs – Gas turbines

GHG – Greenhouse gas

### 3.0 WHO BENEFITS? (Contd)

#### INDIVIDUALS/LOCAL COMMUNITIES

The individual will experience many benefits due to the deployment of ITM Power's technology from cleaner air and health to lower, more stable and secure energy supply.

Network constraints often hinder the deployment of renewable energy schemes, such as wind, due to the expense of connecting/upgrading a connection to the electricity grid. Such stranded renewable energy schemes, cannot fully utilise the electricity generated. The deployment of ITM Power's rapid response electrolyzers provides local communities with the opportunity to make their own renewable clean fuel, at times when electricity is surplus to demand, and eliminate the need for fuel deliveries.

The World Health Organisation 2013 Report 'Health risks of air pollution in Europe', highlighted the significant health effects of Nitrous Oxides (NOx) on human health. The impact of diesel transport on human health is only now starting to be quantified, and as a result of the September 2015 VW 'diesel gate' scandal, are rising to the top of the agenda.

DEFRA has this year used WHO data to calculate the toll of premature deaths caused by NOx: the figure was 23,500 every year, on top of the 29,000 still dying from particulate pollution. The combined impact of these two pollutants represents a significant public health challenge. The UK government itself now estimates that air pollution costs the country £12–18bn a year.

Hydrogen when used as a fuel can offer significant reductions in carbon emissions and improve air quality, eliminating NOx and particulate emissions. The average new car in 2011 had carbon emissions of 133g/km, this compares with 0g/km for a FCEV. It is anticipated that by 2030 the total annual Carbon Dioxide abatement attributed to the deployment of FCEVs will be 3m tons.

#### HYDROGEN PRODUCED BY ITM POWER PEM ELECTROLYSER - ELEMENTS OF VALUE FOR TRANSPORT

##### Benefits of on-site H<sub>2</sub> Generation

- Balancing system generation and load
- Stabilising the grid
- No need for fuel deliveries
- "well to wheel" carbon reduction
- Local fuel for local use

##### FCEV Consumer Benefits

- Range – 350 to 400 miles on a full tank
- Refuelling time – 3 to 5 minutes
- No disruption to normal routine

##### Benefits to the UK of FCEV

- Reducing local environmental impacts of road transport
- Decarbonising road transport
- Creating new economic opportunities
- Rapid consumer adoption – business as usual

4.0

# ACTIVITIES AND OPERATIONS

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## 4.0 ACTIVITIES AND OPERATIONS

**ITM Power's products and services aim to achieve the following environmental benefits:**

### OUTCOME 1 CONVERSION EFFICIENCY

Significant improvements in ITM Power's PEM electrolyser systems have been achieved through a continuous and systematic program of development and testing, resulting in an increase in the system efficiency and longevity of ITM Power's products. These achievements convey environmental benefits in the operational productivity of deployed systems, and have positive implications in the manufacture and life cycle of components (such as reducing the quantity of catalyst materials).

### OUTCOME 2 APPLICATIONS

As a measure of impact, the quantity of hydrogen that is capable of being produced per 24 hours operation by ITM Power's installed electrolyser systems, is used to indicate and enable comparison with the equivalent displacement of petrol and diesel derived carbon dioxide (tonnes). These figures are provided as guidance, based on KPI's for hydrogen production deployed under contract, as specified reported in the company's Annual Report, and reflect the actual cumulative system capacity deployed.

As future deployment of ITM Power's systems within specific application areas (Outcomes 2a to 2f) are realised through deployment and operation, further KPI will be issued, quantifying the benefit.

### OUTCOME 2A POWER GENERATOR CONSTRAINTS

Renewable energy schemes are often located in areas with inadequate or absent grid connection. Electrolyzers can harness the electricity as a clean fuel for local use, so fully utilising electricity generated.

In 2016, ITM Power will be deploying a 0.5MW PEM electrolyser on the Isle of Eday, The Orkney Islands, in Scotland for the European Marine Energy Centre (EMEC) at a Tidal testing site to address grid-capacity constraints on the island. The electrolyser will be used to absorb excess power generated by the tidal turbines testing at EMEC, enabling surplus renewable energy on the island to be used without having to rely upon the inadequate grid. The hydrogen gas generated will be compressed and stored, with some of the gas being used in (an optional) hydrogen fuel cell to provide backup power to critical EMEC systems. The remainder of the hydrogen gas will be used off-site by a further project being developed separately which plans to absorb output of a local community wind turbine operated by Eday Renewable Energy Ltd.

As an increasing quantity of renewable energy supply is connected, the grid needs to be balanced, so that supply matches demand. At great expense renewable energy supply is curtailed, this can be avoided by turning on a load (an electrolyser) on the demand side. The Thüga Group who operate an ITM Power rapid response electrolyser in its Power-to-Gas plant in Frankfurt, have published a system conversion efficiency of 77%, and have now recently (August 15) qualified the system with TenneT the transmission supply operator (TSO) for the secondary power market, providing grid-balancing services. ITM Power's rapid response electrolyzers can qualify for existing National Grid service tariff providing frequency control for demand side loads, thereby fully utilizing surplus renewable energy supply, at times when supply exceeds demand, and avoiding curtailment of renewables and enabling increased capacity of renewable energy to be deployed on the grid.

## 4.0 ACTIVITIES AND OPERATIONS

### OUTCOME 2B

#### CLEAN RENEWABLE TRANSPORT FUEL (GREEN HYDROGEN)

Dispensing green hydrogen (produced from Outcome 1) to hydrogen and fuel cell electric vehicles (FCEVs). The use of FCEVs that can refuel in 3 minutes and have a range of 400miles, enables society and businesses to travel with clean emissions, without disruption to normal routine, improving air quality with a zero carbon footprint fuel.

ITM Power is working to increase the number of hydrogen fuelled vehicles (cars and buses) on the road and has developed partnerships with the key global car manufacturers and engaged with government and industrial consortia to roll-out the hydrogen refuelling infrastructure and hydrogen cars via H<sub>2</sub>Mobility schemes in Europe and USA.

The development of hydrogen infrastructure is also supported by ITM Power's involvement in InnovateUK funded projects in the UK, including: Hydrogen Island project, that integrates hydrogen energy storage and wind energy generation for clean fuel. (Stop Press: ITM Power opened its first public access Wind hydrogen station off Junction 33, South Yorkshire in September 2015); The pan European HyFive project, that sees the deployment of 3 ITM Power hydrogen refuelling stations in London (including locations at the National Physical Laboratory, Tenterden, and at CEME, the Centre of Excellence for Manufacturing and Engineering, that will also see a deployment of fuel cell cars in 2015. A further 2 hydrogen

refuelling stations are to be deployed on retail forecourts further to a strategic forecourt siting agreement (September 2015) with Shell, in London. In California ITM Power are commissioning onsite hydrogen production at refuelling facilities in Riverside City, near Los Angeles and Chino, funded by the State of California.

Future deployment and operation of ITM Power's hydrogen refuelling stations with retail customers will provide the opportunity to assess total impact over a given timescale to be reported.

### OUTCOME 2C

#### CLEAN RENEWABLE FUEL FOR DEPOT AND CAPTIVE FLEETS

Depot fleets operate on a return to base duty cycle, undertaking delivery or commercial logistics. ITM Power's Hydrogen refuelling stations offer on-site production of fuel, at the point of use. Eliminating the need for a fuel delivery and enabling logistics firms to locate and operate within designated low emission zones.

Airports, warehouse logistics, and ports have captive fleets with materials handling equipment these are often under strict air quality and noise regulations, and as such can benefit through deployment of hydrogen fuel cell operated fleets and ITM Power's on site clean fuel production. In addition, ITM Power experience at Marks and Spencer's distribution warehouse in Bradford, UK, showed fast, 90-second refuelling and the extended hours shift range of fork lift trucks improves efficiency of operations.

### OUTCOME 2D

#### RENEWABLE HEAT POWER-TO-GAS ENERGY STORAGE

The injection of clean renewable hydrogen into the gas distribution network, to decarbonise heat. ITM Power has the world's first two operating Power-to-Gas PEM electrolyser systems deployed in Germany. The Thüga Group is using ITM Power's rapid response electrolyser to pilot Power-to-Gas, in Frankfurt, where hydrogen produced by water electrolysis is mixed with methane, and subsequently injected into Frankfurt's gas distribution network for renewable heat. A second generation plant is deployed with RWE in Ibbenbüren. In August 2015, RWE published an efficiency of 86%, utilizing waste heat for a pilot district heat demonstration, in addition to the direct injection into the gas network for renewable heat.

### OUTCOME 2E

#### RENEWABLE CHEMICALS

Hydrogen produced by via ITM Power's electrolyser systems utilizing renewable energy offer the potential to provide the global process and chemical industry with the opportunity to reduce its dependence on fossil fuels and specifically, methane derived hydrogen as an industrial feedstock. Impacts will be measured as and when ITM Power has systems involved in this application.

## 4.0 ACTIVITIES AND OPERATIONS (Contd)

### OUTCOME 2F

#### FOOD SUPPLY SECURITY: CROP YIELD FOR GROWING WORLD POPULATION

Making ammonia and urea from hydrogen derived from wind via ITM Power's PEM electrolysis decouples ammonia and urea production from fossil fuel, enables local decentralized production of sustainable fertilizer with zero carbon emissions, with price stability avoiding links to fossil fuel volatility. In an InnovateUK sponsored project, ITM Power has partnered by Waitrose, The short-term goal is to undertake deployment of a pilot plant to demonstrate the utilization of renewable energy to make fertilizer at a Waitrose farm, prior to commercializing the market application.

### OUTCOME 3

#### ENVIRONMENTAL AND HUMAN HEALTH

The potential to offset and substitute the transport emission pollutants (NOx, particulates and carbon dioxide) through deployment of hydrogen refuelling stations to dispense clean fuel to hydrogen transport that operates with clean emissions. Areas of notable benefit will include cities and urban areas with designated Air quality Management Areas, due to poor air quality associated with pollutants from fossil fuels and associated human health effects. Whilst clean vehicle emissions (tank-to-wheel) are not exclusive to ITM Power's operations, ITM Power is able to offer the "Well to Wheel" emissions saving in provision of a clean fuel; addressing carbon and pollutant free production at source, and

eliminating the need for fuel deliveries, in addition to the clean transport emissions of ultra-low emission vehicles (plug-in electric vehicles).

The replacement of fossil fuels with hydrogen, a clean fuel, eliminates the environmental liabilities associated with accidental release of such fuel to receptors such as land, controlled waters and human health.

As a measure of impact, the quantity of hydrogen that is capable of being produced per 24 hours operation from ITM Power's installed electrolyser systems is given, to indicate and enable comparison with the equivalent displacement of petrol and diesel derived carbon dioxide (tonnes). These figures are provided as guidance based on KPI's reported in the company's Annual Report. Future operation of ITM Power's hydrogen refuelling stations with retail customers will provide data allowing total impact over a given timescale to be reported.

### OUTCOME 4

#### ENERGY SECURITY

ITM Power's products offer society a route to reducing its dependence on fossil fuel, its reliance on fuel imports and the geo-political price volatility and supply of fossil fuels, including oil and gas.

As in Outcome 3, as a proxy, the annual hydrogen production KPI published by ITM Power, has been taken as a figure by which to estimate the daily quantity of fossil fuel replaced or substituted, where 1kg hydrogen has an equivalent energy to 1 US gallon of petrol.

5.0

# STAKEHOLDERS

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## 5.0 STAKEHOLDERS

Our stakeholders include the beneficiaries identified in Section 4:

- Nation states
- Industry
- Individuals/local communities

Engagement with our various stakeholder groups is critical in identifying early market opportunities for deploying ITM Power's products. This includes liaising at policy level in energy and transport in particular, in industry workshops and consultations to develop the adoption of hydrogen as a fuel, and the ensuing cross-sector benefits.

Stakeholder engagement has enabled ITM Power to optimise its product range, focussing on near term markets of energy storage and transport fuel, where a significant demand-pull for its products exist. A result of this has been to focus on MW scale electrolyzers for Power-to-Gas and hydrogen refuelling stations.

Stakeholder Group	Activity	# Of Sessions	# Engaged	Topics of Engagement
Nation States/Industry	Consultation	>100	>100	Energy Storage, Renewable heat and H <sub>2</sub> Mobility in UK France Germany
Nation States/Industry/Individuals, Local Communities	RNS emails announcements	26	>22,000	Regulatory and non-regulatory company announcements and news
Industry/Individuals, Local Communities	Dissemination events and presentations	>100	>5000	Grid gas (Power-to-Gas feasibility study), energy storage clean fuel events
Industry, Individuals Local Communities	Press Media	>50	unknown	Energy storage, case studies
Individuals, Local Communities	Sponsorship	1		GLA "Hydrogen London" School's 'Hydrogen Transport Challenge'
Nation States/Industry/Individuals, Local Communities	Social Media	Numerous	 1646 followers  2258 followers  667 likes  741,480 views	Energy storage and clean fuel

## 5.0 STAKEHOLDERS (Contd)

ITM Power also has the following stakeholders:

- Staff. ITM Power's staff are integral to its business. ITM Power regularly update staff on developments in energy and transport markets through company presentations
- Project Partners, including local authorities, universities, national governments, oil companies
- Customers, including utility and energy companies, distribution and logistics companies and research institutes
- Suppliers
- Research bodies with whom ITM Power develops new technologies
- Industry that will either use ITM Power products directly or rely on a hydrogen infrastructure

Shareholders who will gain through the increase in capital value of the company and through future dividend income streams. ITM Power is a public limited company, listed on the Alternative Investment Market (AIM) of the London stock exchange. The Company has a variety of shareholders, including both institutional and private investors. ITM Power issues an Interim and an Annual Report for its investors and carries out a number of investor presentations allowing direct feedback to the Company Directors.

### **There is constant ongoing dialogue with:**

- Project partners
- Research bodies
- The energy and automotive industry
- Policy makers (national and international)
- Technical Committees, Expert Groups for developing regulations, codes and standards

Through membership of the UK, French, Swiss and US national hydrogen mobility programmes (and associate membership of the German programme) ITM Power is in close touch with a wide range of stakeholders including governments, fuel retailers and automotive manufacturers.

The Company works closely with the auto OEMs to promote the launch and demonstration of fuel cell vehicles. This past year, ITM Power took delivery of one of the first Hyundai iX35 Fuel Cell cars, and will be the first UK customer for the Toyota "Mirai" this Autumn.

ITM Power is the only non-German company to be invited on to the German Energy Agency's Power-to-Gas Platform, and are members of the North Sea Power-to-Gas Consortium, evaluating hydrogen energy storage and offshore wind generation wind. ITM Power is also members of the Mediterranean Power-to-Gas Consortium.

Industry partnerships include the Thüga Group and RWE, for operation, demonstration and dissemination of the Power-to-Gas to policy and industrial groups, and with NRM for compliant gas mixing plant, Germany for Power-to-Gas projects. A Gas network optimisation contract was signed with AMEC and National Grid.

ITM Power signed a strategic forecast siting agreement with Shell in September 2015, to integrate its electrolyser systems on retail forecourts for on-site production of hydrogen for public refuelling of fuel cell electric vehicles.

During the year ITM Power reviewed its stakeholders and determined that there have been no material changes to its core stakeholder groups.

6.0

# EVIDENCING SOCIAL AND ENVIRONMENTAL VALUE

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## 6.1 EVIDENCE

Stakeholder Group	Outcome	Indicator	2013 (Actual)	2014 (Actual)	2015 (Actual)	2016 (Target)
Nation states	<b>Outcome I</b> Efficient hydrogen energy generation	Increasing the conversion efficiency of ITM Power's PEM electrolysis stack for, enhanced performance, competitive advantage, reduced footprint, and increased fossil fuel substitution	77%	80%	84%	84%*
		Test hours completed	500,000	750,000	1.11million	1.4million
Industry	<b>Outcome 2</b> Applications	Hydrogen production capacity deployed under contract	300kg /24hr	1000kg /24hr	1600kg /24hr	>2600kg /24hr
	<b>Outcome 2A</b> Power generators					
	<b>Outcome 2B</b> Transport fuel					
	<b>Outcome 2C</b> Depot and captive fleets					
	<b>Outcome 2D</b> Power-to-Gas (renewable heat)					
	<b>Outcome 2E</b> Renewable chemicals					
	<b>Outcome 2F</b> Renewable fertiliser					
Individuals and local communities	<b>Outcome 3</b> Environmental and human health	Carbon dioxide emissions saved by using hydrogen instead of petrol (10.4kg carbon dioxide/gallon petrol)	3.1t CO <sub>2</sub> /24hr	10.4t CO <sub>2</sub> /day	16.6t CO <sub>2</sub> /day	>27t CO <sub>2</sub> /day
		Carbon dioxide emissions saved by using hydrogen instead of diesel (12.2kg carbon dioxide/gallon diesel)	3.6t CO <sub>2</sub> /24hr	12.2t CO <sub>2</sub> /day	20.2t CO <sub>2</sub> /day	>31.7t CO <sub>2</sub> /day
Nation states	<b>Outcome 4</b> Energy security	Hydrogen production capacity deployed under contract	300kg /24hr	1000kg /24hr	1600kg /24hr	>2600kg /24hr

Where 1kg hydrogen has the equivalent energy of 1 US gallon petrol, or 0.88 US gallon diesel.  
 Carbon dioxide figures assume renewable energy source of electricity.

\*Current focus is on cost reduction, increasing the quantity of hydrogen produced whilst maintaining high efficiency.

## 6.2 CURRENT MANAGEMENT

### CORPORATE SOCIAL RESPONSIBILITY

The Board of Directors meet regularly to review specific and general risks that face the Company and strives to position the Group and Company in a way that any risks can be minimised and met, should the need arise.

As in last year's Impact Report, the focus continues to be to provide data on ITM Power's deployed systems that are compliant and approved for sale around the world.

The company has systems and processes in place to provide accurate data reflecting the key performance indicators for non-financial information, and communicating these to its stakeholders. This data can be used to interpret advances and improvement in the product offering, as well as quantifying the deployed capacity and inferring the resulting environmental and social benefits. The disclosures made in this the third Impact report are aligned with ITM Power Plc Annual Report, published for year ended 30 April 2015.

Given the early stage of development of the hydrogen market, ITM Power considers that its impacts would not have happened without ITM Power operating. In other words the measures based on hydrogen capacity and production and carbon displacement should be considered 'additional'.

## 6.3 FUTURE PLANS

ITM Power is committed to reporting regularly on the environmental impact of its products and activities. As deployment of ITM Power's products becomes more mainstream, we expect that much more data will become available, enabling a greater understanding and more thorough reporting of ITM Power's impacts at both a company level and a product level.

**As reported last year, in the future we will look at ways in which we can report on:**

- Impacts on our staff
- Increasing scope of key performance indicators for applications, including case study examples
- Communicating the Lifecycle analysis of our products. We aim to maximise the recyclability of the components of our products

Commitment in 2014 Impact Report	Progress made this year
Increasing the scope of key performance indicators to applications	This will be reported, as applications such as hydrogen refuelling station deployment and utilisation become available for future Impact Reports
Communicating Life cycle analysis of our products, maximising recyclability of the components of our products	Whilst no life cycle analysis has been placed in the public domain, the Company has systems for driving continual technological improvements, as reported for efficiency and stack design, and so minimise the use and quantity of component materials, improving environmental credentials as well as cost reduction.
Report on impacts of our staff communities	The Company actively supports and encourages Continual Professional Development, including study leave, funding research degrees, and internships. The status of staff impacts essentially remain the same, this year

7.0

# APPENDIX

## MARKETS

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- |     |                               |
|-----|-------------------------------|
| 7.1 | JCB Investment                |
|     | Energy Storage – Power-to-Gas |
| 7.2 | Clean Fuel – Hydrogen Fuel    |

## JCB INVESTMENT

J.C.B. Research and Valebond Consultants Limited, a Company wholly owned by Jo Bamford have together acquired a strategic shareholding in the Company by way of a subscription for new ordinary shares making them, in aggregate, ITM Power's largest shareholder.



*Jo Bamford and Lord Bamford*



“We are excited by the prospects of hydrogen technology and our investment in ITM Power. We expect to be an actively supportive shareholder in ITM Power and look forward to working with the Board and management team and to sharing some of our expertise in manufacturing and engineering.”

**Lord Bamford**  
**J.C.B. Research**



JCB CONTINUES  
TO INVEST HEAVILY  
IN RESEARCH AND  
DEVELOPMENT, KEEPING  
JCB AT THE CUTTING  
EDGE OF INNOVATION

JCB CHAIRMAN  
LORD BAMFORD  
IS A LEADING  
INDUSTRIALIST WHOSE  
CAREER SPANS OVER  
FIVE DECADES

3 1 2  
JCB IS ONE  
OF THE WORLD'S  
**TOP THREE**  
MANUFACTURERS  
OF CONSTRUCTION  
EQUIPMENT BY VOLUME

JCB EMPLOYS AROUND  
12,000 PEOPLE  
ON FOUR CONTINENTS  
AND SELLS  
PRODUCTS IN  
150 COUNTRIES  
THROUGH 2,000  
DEALER DEPOTS

## 7.1

# ENERGY STORGARE POWER-TO-GAS

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"I would argue that the technology's deployment is inevitable owing to the amount of renewables coming on stream, and that by 2050 – based on our studies – there is likely to be a need to store as much as 50TWh. The annual storage capacity of the German gas distribution network is about four times larger than this quantity – and that's the charm of P2G.

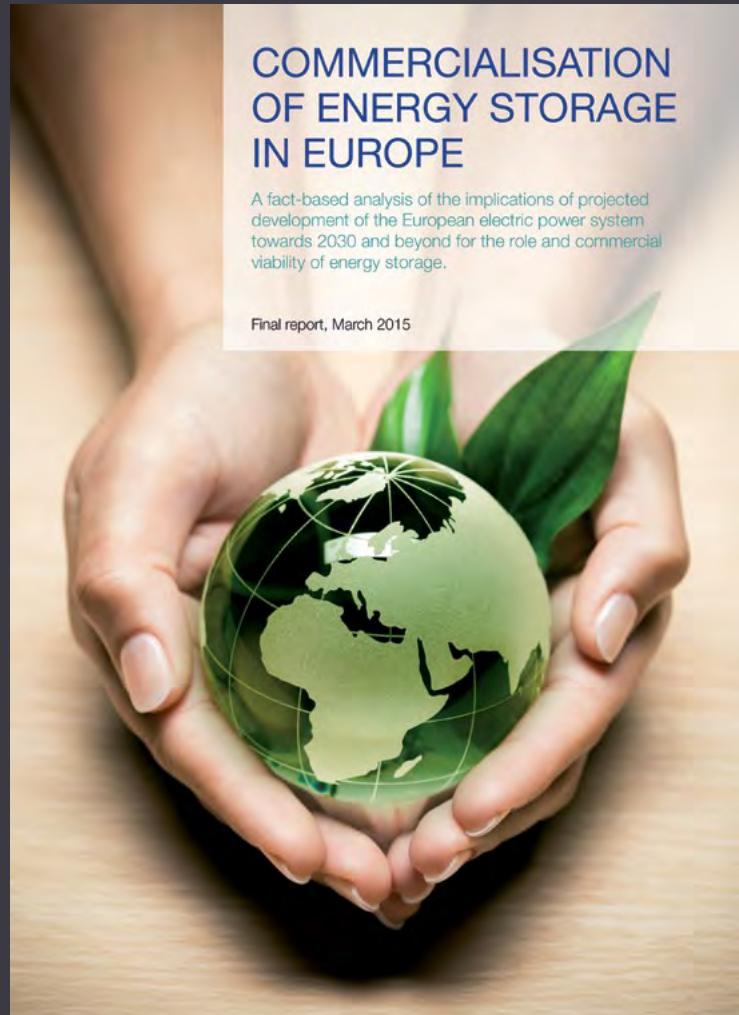
**Dr. Elke Wanke**  
Project Leader, Thüga Aktiengesellschaft

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## COMMERCIALISATION OF ENERGY STORAGE IN EUROPE REPORT

In March 2015 the Fuel Cell and Hydrogen Joint Undertaking (FCHJU), supported by the European Commission, and 32 commercial companies including ITM Power, published a report on the findings of a study exploring a deeper understanding of the role and commercial viability of energy storage in enabling increasing levels of intermittent renewable power generation.

It highlighted that the share of Renewable Energy Sources (RES) in the European electric power generation mix is expected to grow considerably, constituting a significant contribution to the European Commission's challenging targets to reduce greenhouse gas emissions. The share of RES production in electricity demand should reach about 36% by 2020, 45-60% by 2030 and over 80% in 2050.



## THÜGA GROUP'S POWER-TO-GAS UPDATE

Following a year's successful operation in the field, the Thüga Group provided an update on the project stating that ITM Power's electrolyser has exceeded expectations. Of particular note was system response time and efficiency which was independently measured to be over 70% with a peak of 77%. The system has continued to be exposed to a series of stress tests, the results of which are fed back to the thirteen project partners, combining knowledge and experience regarding the practicalities of Power-to-Gas.

The ITM Power HGas system is controlled by the grid operator acting as a transducer between power and gas. It is turned on when there is an excess of renewable wind power on the electricity grid to generate hydrogen through PEM electrolysis which is put straight into the natural gas network. This model creates the perfect solution for balancing the grid against intermittent renewable energy.

The unit was the first plant to inject electrolytic generated hydrogen into the German gas distribution network. The second plant to inject hydrogen into the German gas distribution network was also supplied by ITM Power, purchased by RWE after a competitive tender process. The operational data generated has put ITM in a strong and unique position to engage further in this key territory for Power-to-Gas energy storage.

Given the high volumes of energy that must be stored, Power-to-Gas technology holds great significance. According to a Thüga analysis, storage requirements in Germany could be as high as 17 terawatt hours (TWh) by 2020, and reach 50TWh by 2050. The municipal gas distribution network can easily absorb these quantities.

"We want to integrate the plant so that it autonomously compensates for the differences between renewable energy generation and power consumption.

"Energy storage, and thus by extension Power-to-Gas technology, is key to the success of the Energiewende. For its development, we in Germany in the long-term need a sustainable market model – as has for example been presented by the Thüga Group – and one that guarantees the economic operation of energy storage.

"Our gas distribution network could thus be the battery of the future."

**Michael Riechel**  
Member of the Board of Thüga AG



"The development of storage technologies is one of the main challenges for the energy transition (Energiewende), if the integration of wind and solar power is to succeed. The companies involved in this innovative project are making a significant contribution."

Tarek Al-Wazir  
Hessian Minister of Economics

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*Tarek Al-Wazir, Hessian Minister of Economics, Energy, at the commissioning of the Power-to-Gas demonstration plant at the site of Mainova AG in Frankfurt.*

# RWE

## PROJECT

ITM POWER SUCCESSFULLY DELIVERED THE RAPID RESPONSE POWER-TO-GAS PEM ELECTROLYSER SYSTEM IN FEBRUARY 2015 SOLD TO RWE DEUTSCHLAND AG WITHIN 10 WEEKS FROM RECEIVING THE ORDER.

In December 2014 ITM Power won a competitive tender for the supply of a rapid response Power-to-Gas PEM electrolyser system issued by RWE. Due to increased productivity, and as a result of product standardisation, delivery timescales were significantly reduced and ITM Power achieved assembly, factory acceptance testing and delivery in less than ten weeks from receiving the order.

This is the third rapid response Power-to-Gas energy storage system installed by ITM Power in Germany. It is the first second-generation unit and represents another reference site for ITM Power's world leading technology.

The second-generation unit is using a higher current density, permitting higher hydrogen output per stack. The system efficiency is also increased by simplification of the balance of plant. The system incorporates the very first deployment of the new AEG advanced power conversion electronics, the benefits of which include: ultra-high power factor, rapid response time and higher efficiency over full operating range.

RWE will be injecting hydrogen into the gas network as part of their Power-to-Gas installation and evaluating the very fast electrolyser system response and exploring its exploitation in grid balancing.

“The delivery of this second-generation electrolyser unit within ten weeks has been enabled by an ongoing production run of standard electrolyser systems. It is testimony to the great working relationship which has been developed between ITM Power and RWE and we are delighted to be integrating the best technology available.”

Phil Doran, MD  
**ITM Power GmbH**



ITM Power electrolyser arrives on RWE Deutschland site in Ibbenbüren



## PROJECT

### Energy Storage for European Marine Energy Centre (EMEC) tidal test site.

In April 2015 ITM Power won a competitive tender to supply an integrated hydrogen system for use at the European Marine Energy Centre (EMEC) tidal test site on Eday, Orkney, Scotland. The system's principal component is a 0.5MW polymer electrolyte membrane (PEM) electrolyser with integrated compression and up to 500kg of storage.

The 0.5MW electrolyser will be used to absorb excess power generated by the tidal turbines testing at EMEC. The hydrogen gas generated will be compressed and stored, with some of the gas being used in (an optional) hydrogen fuel cell to provide backup power to critical EMEC systems.

The remainder of the hydrogen gas will be used off-site by a project being developed separately which plans to absorb output of a local community wind turbine operated by Eday Renewable Energy Ltd.

The electrolyser will be packaged in a standard 20 and 10 ISO container and is summarised below:

- Hydrogen generation capacity up to 220kg/24hours
- Self-pressurisation up to 20bar
- Rapid response
- Hydrogen purity satisfying ISO 14687
- CE compliant

“We are really excited about the deployment of ITM Power’s PEM electrolyser system on Eday. This is an innovative way to tackle the shortcomings of the local grid which is holding back marine energy in Orkney. It will allow us to not only pilot the production of hydrogen fuel from tidal energy, but will allow surplus renewable energy on the island to be used without having to rely upon the inadequate grid. We really see this as the moment we begin to break away from the shackles of a 20th Century cable architecture.”

Neil Kermode  
**Managing Director, EMEC**



*OpenHydro's tidal turbine at a European Marine Energy Centre (EMEC) tidal test site. Photographer Mike Brookes-Roper*

7.2

## CLEAN FUEL HYDROGEN FUEL

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“We are so focused on hydrogen because at its most simplistic oxygen and hydrogen makes water and power. The fuel cell vehicle is a social and economic game changer. Gasoline (petrol) has been the primary fuel of the first hundred years. Hydrogen will be the primary fuel game of the next hundred years. Our primary task is to provide our customers with fuel-cell cars at an affordable price.”

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Takeshi Uchiyamada  
Chairman of Toyota

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## HYDROGEN FUEL

ITM Power is active in projects which support the roll-out of hydrogen powered vehicles and refuelling stations. The EU funded Hydrogen for Innovative Vehicles (HyFive) project includes 15 partners who will deploy 110 FCEVs manufactured by five global automotive companies across three European cluster locations. ITM Power is providing three hydrogen refuelling stations to London for deployment summer 2015. Each will include both on-site electrolyser systems and 700bar refuelling capacity.

A further activity has been the UK H<sub>2</sub>Mobility project, of which ITM Power was a founder member. The project envisages 65 stations being deployed in the UK by 2020. Financial support for this was recently announced by OLEV with £7.5m total funding – £2m available for FCEV, £2m for HRS upgrades and £3.5m for new HRS. ITM Power looks forward to working with partners from the fuel cell vehicle manufacturers and local, national and European funding partners in the coming years to deploy further stations and achieving the agreed 2020 goal.

In October 2014 the UK Government announced that they would commit £11m to industry to prepare the UK for the roll-out of hydrogen fuel cell electric vehicles. The investment will see an initial 15 hydrogen stations by the end of 2015 and includes £2 million of funding for the public sector to purchase the hydrogen vehicles. This was a further step in funding for rolling out the initial national hydrogen network of 65 stations which have been identified by UK H<sub>2</sub>Mobility.

A focus has also been placed on establishing a network of hydrogen stations and commercialising a number of fuel cell buses. In November 2014 the Fuel Cell Hydrogen Joint Undertaking (FCHJU) launched an initiative which was signed by manufacturers and bus operators from major European cities, including London, which will aim to deploy a total volume of 500-1,000 fuel cell buses into Europe by 2020.

Toyota launched their fuel cell electric vehicle (FCEV), the Mirai in November 2014 and sales started in Japan a month later on 15th December. This saw 1,500 orders secured in the first month, tripling initial projections of 400 vehicles. The production of the vehicle will be scaled up to meet demand and the Mirai will be on sale in Europe later in 2015, with first deliveries to the UK expected in September.

Meanwhile the first Hyundai ix35 FCEVs, funded under the HyFive London Cluster, are now deployed in the UK with further roll-out expected as the infrastructure provision develops.



“Today we are at a turning point in automotive history. A turning point where people will embrace a new, environmentally-friendly car that is a pleasure to drive. A turning point where a four-door sedan can travel 300 miles on a single tank of hydrogen, can be refuelled in under five minutes and emit only water vapour. We believe that behind the wheel of the Mirai, we can go places we have never been, to a world that is better, in a car that is better. For us, this isn’t just another car. This is an opportunity – an opportunity to really make a difference. And making a difference is what Toyota is all about.”

Akio Toyoda’s  
CEO of Toyota Motor Corporation

## SITING COLLABORATION WITH MAJOR GLOBAL FUEL RETAILER AND MORE STATIONS FOR LONDON

In March 2015 ITM Power was awarded a total of £2.89m by the Hydrogen Refuelling Stations (HRS) Infrastructure Grants Scheme, run by the Office of Low Emission Vehicles (OLEV). The award is to build two new HRS in London, sited with strategic partners and for the upgrading of four existing ITM Power refuelling stations.

One of the new stations will be built on the forecourt of a major global fuel retailer. ITM Power has signed a Memorandum of Understanding (MoU) with the retailer to build initially up to three HRS in London and will be seeking funding support for at least one more station. The MoU also allows for further development of the collaboration in the UK. ITM Power will be working closely with OEM FCEV providers to determine the best locations for the further station.

The upgrades included the three in London under development as part of the HyFive project and one in Rotherham, just off the M1 at Junction 33. The latter will be upgraded from 350 to 700bar refuelling capability. This strategic refuelling location will allow FCEV users to travel between London and the North of England.

By the beginning of 2016 ITM Power will own and operate six hydrogen fuel stations in the UK, mainly centred around London.



*Wind hydrogen station at the Advanced Manufacturing Park*

## WIND HYDROGEN FUEL STATION AT THE ADVANCED MANUFACTURING PARK

ITM Power's first commercial scale (80kg/day) refueller, sited less than two miles from Junction 33 on the M1 has been delivered to site and is undergoing commissioning. The station is located at The Advanced Manufacturing Park in Rotherham and is due to open for 350bar refuelling in August 2015. The electrolyser is coupled to a 225kW wind turbine and takes the excess electricity from this turbine to generate hydrogen gas. This is then used to refuel vehicles in around 3-5 minutes.

The electrolyser build programme went to schedule and the system achieved a CE mark and successfully completed Factory Acceptance Testing. The measured system efficiency of the electrolyser system is <55kWh/kg (>71%) which surpasses the target set by the Fuel Cell and Hydrogen Joint Undertaking (FCH JU) for 2017.

This project represents the first deployment in the UK of the Company's standardised HGas180 platform, capable of generating 80kg of hydrogen per day. The first such unit was deployed for a Power-to-Gas application in Germany, operated by RWE. Three identical units are now finalising construction for deployment in London as part of the HyFive project and this forms the template for further hydrogen refuelling systems.

The station was co-funded by Innovate UK and will be upgraded to 700bar refuelling under the OLEV HRS upgrade scheme. This strategic refuelling location will allow FCEV users to travel between London and the North of England and will be open to the public for fuel cell electric vehicles.

## OPENING OF M1 HYDROGEN FUEL STATION

To mark the opening of the Hydrogen Fuel Station at the Advanced Manufacturing Park a launch event has been planned for 17th September 2015.

This event will give local businesses, fleet managers and potential end-users the chance to visit the station and learn more about ITM Power's electrolysis and refuelling technologies.

## HYFIVE, UK

Hydrogen for Innovative Vehicles (HyFive) is an ambitious European project funded by the FCH JU under the EU Framework 7 programme. It includes 15 partners who will deploy 110 FCEVs manufactured by five global automotive companies across three European cluster locations. As part of the project, ITM Power is providing three new hydrogen refuelling stations to London for deployment in summer 2015. Each will include both on-site electrolyser systems and 700bar refuelling capacity. Siting activities have been ongoing both for HyFive refuelling equipment and for potential additional roll-out programmes. The three ITM Power HyFive HRS currently being built will also benefit from new telecoms and security equipment. ITM Power has gained planning permission for two London HyFive HRS, the first of which will be located within quarter of a mile of the A313 and the second within a quarter of a mile of the A40. Ground works are underway at the first HyFive site. The first HyFive HRS will open to hydrogen vehicle users in Q3 2015.

### HRS Manufacturing

The electrolyser build programme took place in parallel with functional and compliance testing in Q2 of 2015 ahead of commissioning in Q3 of 2015. The build programme benefited from ITM Power's expanded testing facilities which enable multiple units to undergo factory acceptance testing simultaneously.

### FCEV Roll-out in the UK

The first Hyundai ix35 FCEVs, funded under the HyFive London Cluster, are now deployed in the UK with further roll-out expected as the infrastructure provision develops. Toyota has launched the Mirai FCEV and will begin to sell this in Europe later in 2015.

*One of three ITM Power HFuel hydrogen stations for the HyFive project*



## ITM POWER RECEIVED ONE OF THE FIRST HYUNDAI IX35 FUEL CELL VEHICLES TO ARRIVE IN THE UK

The vehicles being rolled-out are a result of the pioneering £31m Hydrogen For Innovative Vehicles (HyFive) project funded by the FCH JU under the EU Framework 7 program. The project which brings together vehicle manufacturers, commercial hydrogen fuel suppliers and government departments aims to make hydrogen vehicles a viable and environmentally-friendly choice for motorists across Europe.

HyFive will see a total of 110 hydrogen fuel cell vehicles rolled out to various European locations including Bolzano, Copenhagen, Innsbruck, Munich, Stuttgart and London. These vehicles will be supported by clusters of hydrogen refuelling stations, twelve of which are already in existence, and a further six to be deployed.



*ITM Power Charles Purkess with Hyundai ix35 fuel cell vehicle one of the first to own a FCV in UK*

“Making the first UK customer deliveries of hydrogen-powered cars is a huge landmark for the industry. Hyundai is the first Company in the world to start series-production of a fuel cell vehicle and is committed to rolling-out this technology in line with government plans to grow the refuelling infrastructure.”

Tony Whitehorn  
President and CEO, Hyundai Motor UK

## ITM POWER – REGULATORY NEWS ANNOUNCEMENTS 2014-2015

## 2015

Director/PDMR shareholding	22 Apr	RNS
Second price monitoring extension	17 Apr	Submitted by 3rd party (by the LSE)
Price monitoring extension	17 Apr	Submitted by 3rd party (by the LSE)
£1.79m electrolyser sale to EMEC	16 Apr	RNS
£2.89m award for two new London refuelling stations	27 Mar	RNS
£4.9m strategic investment by JCB in ITM Power	12 Mar	RNS
RWE Power-to-Gas system delivered	18 Feb	RNSR
Thüga Group's P2G plant exceeds expectations	12 Feb	RNSR
Half year results for the period ended 31 October 2014	29 Jan	RNS
Major new European report on Power-to-Gas energy storage	28 Jan	RNSR
Enhanced product range for Power-to-Gas market	20 Jan	RNSR
Toyota makes available thousands of fuel cell vehicle and refuelling patents royalty-free	06 Jan	RNSR
Manufacturing, testing and power supply expansion	05 Jan	RNS

## 2014

Gas network optimisation contract with AMEC and National Grid	18 Dec	RNS
Sale of second major Power-to-Gas plant	11 Dec	RNS
£0.9m funding for the HELES project	27 Nov	RNS
Thüga Power-to-Gas project update	25 Nov	RNS
Toyota launches the Mirai fuel-cell electric car	19 Nov	RNSR
European bus manufacturers and leading mayors sign fuel cell electric buses LoU	17 Nov	RNSR
ITM Power takes delivery of Hyundai ix35 fuel cell vehicle	20 Oct	RNSR
Government funding to help prepare the UK for the arrival of hydrogen FCEVs	09 Oct	RNS
Trading update	07 Oct	RNS
Toyota to launch fuel cell sedan in 2015	02 Oct	RNSR
Results for the year ended 30 April 2014	30 Jul	RNS
Appointment of non-executive Director	04 Jul	RNS
Commercial product platform optimisation and cost reduction	27 May	RNSR
Thüga Group's Power-to-Gas plant officially commissioned and operational	08 May	RNSR
Second US hydrogen refuelling station	02 May	RNS



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**Social Stock Exchange Impact Reporting**

**Year Three Impact Report**

**Disclosure Checklist**

*Version 1.3*

## Disclosure Statements

### Governance

- 1.1. Name of SSX Member Organisation: ITM Power
- 1.2. Please provide the name of the entity (team/governing body) responsible for oversight of the organisation's social objectives (as referenced in Section 2 of the Impact Report):  
ITM Management
- 1.3. How many times did this entity meet during the year? regular monthly

#	Disclosure Statement	Confirm
1.3	During the year, the core mission and social purpose of the organisation was reviewed by the entity described in statement 1.1 above.	<input checked="" type="checkbox"/>
1.4	The entity described in statement 1.1 above was satisfied that the organisation is continuing to achieve its mission and is working towards its stated social purpose.	<input checked="" type="checkbox"/>

### Stakeholder engagement

- 1.5. Please provide a summary of the engagement activities the organisation has undertaken with the organisation's core stakeholder groups during the year (which are impacted by its operations). You can add additional rows if necessary:

Stakeholder Group	Activity	# of sessions	# engaged	Topics of engagement
Stakeholder Group	Activity	# Of Sessions	# Engaged	Topics of Engagement
Nation States/ Industry	consultation	>100	>100	Energy Storage, Renewable heat & H2 Mobility in UK France Germany, Cars & Buses
Nation States/ Industry/Individuals, Local Communities	RNS emails announcements	11	>22,000	Regulatory and non-regulatory company announcements and news
Industry/ Individuals, Local Communities	Dissemination events & presentations	>100	>5000	Power to Gas energy storage Clean fuel events
Industry, Individuals Local Communities	Press Media	>50	unknown	Energy Storage, Case studies
Individuals, Local Communities	Sponsorship	1		GLA "Hydrogen London" School's "Hydrogen Transport Challenge"
Nation States/ Industry/Individuals, Local Communities	Social Media	numerous	Linkedin 1646  Twitter 2258  Facebook 667  ..	Energy storage and clean fuel

1.6. Please provide a summary of actions the organisation has taken as a result of this engagement (no more than 500 words):

Engagement with our various stakeholder groups is critical in identifying early market opportunities for deploying ITM Power's products. This includes liaising at policy level in energy and transport, in particular, to develop the adoption of hydrogen as a fuel, and the ensuing cross-sector benefits. Stakeholder engagement has enabled ITM Power to optimise its product range, focussing on near term markets of energy storage and transport fuel, where a significant demand-pull for its products exist. An example of this has been to focus on larger MW scale electrolyser platform for Power to Gas and hydrogen refuelling stations, as opposed to the low kW scale.

### Material changes

For the following statements, please answer 'yes' if any material changes have occurred during the year, and provide details of the change on the following page:

#	Report Section	Decision Point	Yes	No
2.1	Social Purpose and Context	Has the organisation materially changed or updated its social purpose or mission?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.2	Social Purpose and Context	Has responsibility for oversight of the organisation's social objectives, mission or social purpose changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.1	Who Benefits	Have any of the organisation's core stakeholder groups changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.2	Who Benefits	Has the policy, regulatory or market context of the organisation materially changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.1	Activities and Operations	Has the organisation changed its core activities and/or core operations, or acquired or divested of businesses which affect its core purpose?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.2	Activities and Operations	Have any of the outcomes experienced by the organisation's core stakeholder groups changed (described by the organisation as resulting from its activities)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.1	Stakeholders	Has the organisation changed its methods of stakeholder engagement?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.2	Stakeholders	Have relationships with any key partners of the organisation changed (i.e. those partners that are critical to delivery)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## **Further Detail**

In the table below, please provide further details where you answered 'yes' to the decision points listed above. Note that you will need to submit updated versions of all sections which have material changes in them as defined by this table. You should also include details of any updates you have made to sections of your Impact Report to evidence the Year Two requirements, such as proportionality, materiality or stakeholder engagement.

#	Report Section	Decision Point	Detail
2.1	Social Purpose and Context	Has the organisation materially changed or updated its social purpose or mission?	
2.2	Social Purpose and Context	Has responsibility for oversight of the organisation's social objectives, mission or social purpose changed?	
3.1	Who Benefits	Have any of the organisation's core stakeholder groups changed?	
3.2	Who Benefits	Has the policy, regulatory or market context of the organisation materially changed?	
4.1	Activities and Operations	Has the organisation changed its core activities and/or core operations, or acquired or divested of businesses which affect its core purpose?	
4.2	Activities and Operations	Have any of the outcomes experienced by the organisation's core stakeholder groups changed (described by the organisation as resulting from its activities)?	
5.1	Stakeholders	Has the organisation changed its methods of stakeholder engagement?	
5.2	Stakeholders	Have relationships with any key partners of the organisation changed (i.e. those partners that are critical to delivery)?	

## Document sign-off

This document should be signed off by a representative of the entity (team/governing body) responsible for oversight of the organisation's social objectives, as referenced in statement 1.1 below and Section 2 of the Impact Report, to verify the accuracy of the disclosures presented by the Member Organisation:

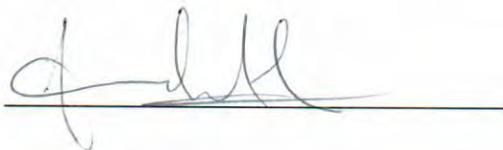
The Impact Report submitted by our organisation is:

A new Impact Report

An update to our Year Two Impact Report, by exception

*I certify that this document, when considered in conjunction with my organisation's SSX Year One and Year Two Impact Report submissions, provides a fair representation of the changes in the social and/or environmental impact of my organisation. I further certify that all material information relevant to the impact performance of my organisation in the year since the publication of my organisation's SSX Year Two Impact Report has been included in either this document and/or my organisation's SSX Year Three Impact Report.*

Signature:



Name:

Andy ALLEN

Role:

CFO & COMPANY SECRETARY

Date:

7 October 2015



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