



Zenergy Power plc

The Superconductor Energy Technology Company

Environmental Opportunities Forum

Karen Chandler - CFO

26th March 2010



Zenergy Power – World’s Only Superconductor Pure-Play

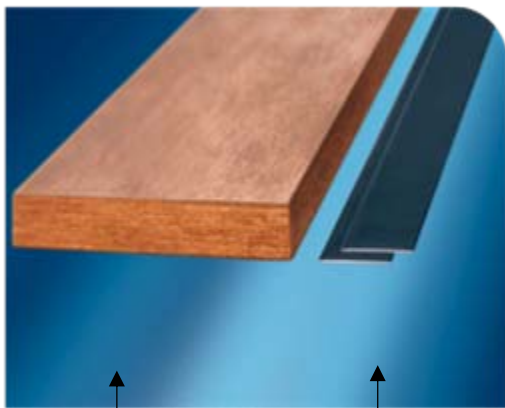
- **Zenergy Power Plc**
 - Admitted to London AIM (ZEN.L) 2006
 - Market Cap ~ £90m
 - Employees ~ 100
- **Entities incorporated**
 - Germany 1999 (MBH, wires, coils, magnets)
 - USA 2004 (fault current limiters)
 - Australia 1987 (fault current limiters)
 - UK 2005 (finance, investor relations)
- **Intellectual Property** – Over 170 patents and applications



Superconductors – Zero resistance

Superconductors have 2 key properties:




- **100% Efficiency** : No losses – resulting in a dramatic reduction on CO2
- **100X Capacity** : Dramatic reduction in material use

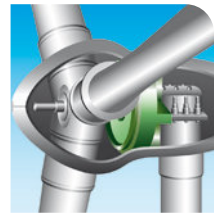


Copper Wire Superconducting Wire

Superconductors enable Zenergy Power to provide economic and ecological solutions

Three Energy Sectors – Renewables, Smart Grid and Energy Efficiency

Sector	Application	End Products
 Renewable Energy	Power Generation	Hydro and Wind Generators
 Smart Grid	Transmission & Distribution	Fault Current Limiter (FCL)
 Energy Efficiency	Power Conversion	Magnetic Billet Heater (MBH)





Zenergy Power – Always 1st

1st worldwide

- Magnetic Billet Heater in extrusion — 250,000 heated billets since July 2008



1st in the U.S.

- MV Fault Current Limiter operating in Los Angeles grid March 2009



1st worldwide


- World's first superconductor hydro-generator due for installation into E.ON's dam 2010



1st worldwide

- Scaled 8MW (500 kW) direct-drive offshore wind generator 2010/2011 with Converteam





Safeguarding reliable power supply



1. Smart Grid Technologies

"Blackouts cost the U.S. economy between \$104 bn and \$164 bn every year"

Electric Power Research Institute - 2001

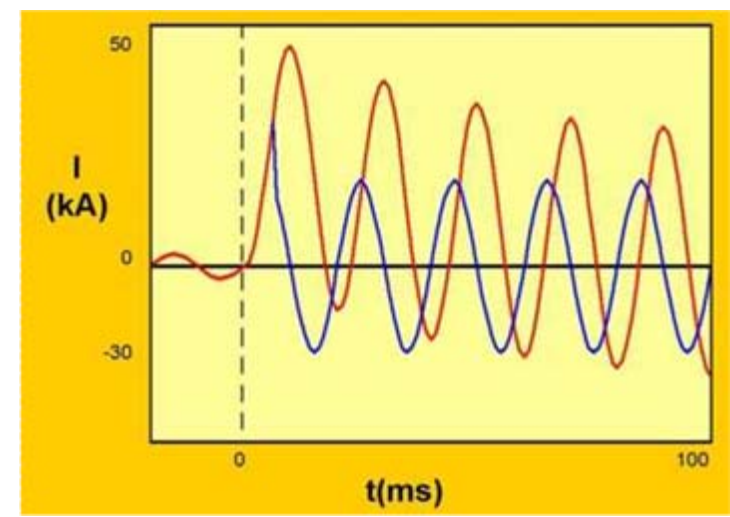


Fault Current Limiter: Preventing Blackouts

- Protect grid equipment from damaging fault currents
- Significantly reduce cost of upgrading substations
- Prepare the grid for renewable energy integration

- Zenergy patented FCL solution:
- Suppresses large-scale fault currents
- Provides immediate response to multiple faults
- Is 'invisible' to the grid until needed
- Inherently fail safe
- Financially supported by US government

- Approx. 250,000 substations exist worldwide





Commercialisation

Expected delivery	Application	Customer	Voltage	Country
Medium Voltage				
Mar 2009	Operation – CEC funded unit	SCE	13.8 kV	USA
Jun 2009	Sale test unit	ConEd	13.8 kV	USA
2010	Sale full unit	ASL	12 kV	UK
High Voltage				
End 2010	Single phase– DOE funded unit	AEP	138 kV	USA
End 2011	Three phase– DOE funded unit	AEP	138 kV	USA



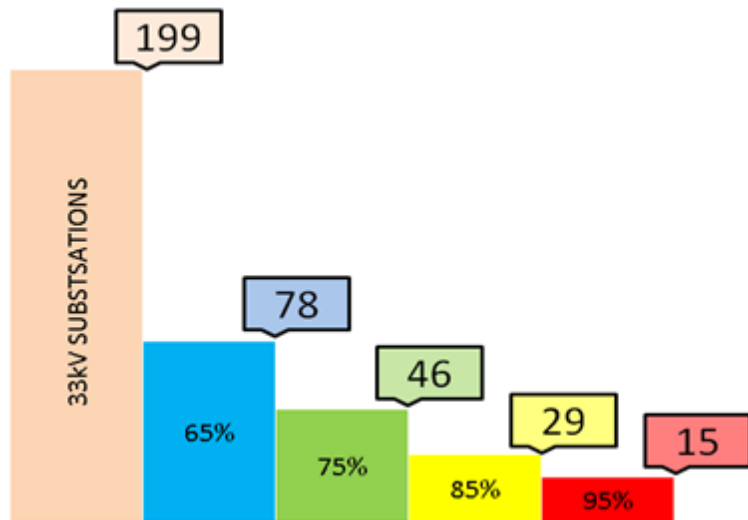
- Within the next 2-3 years 6 FCL or more will be installed in the UK grid





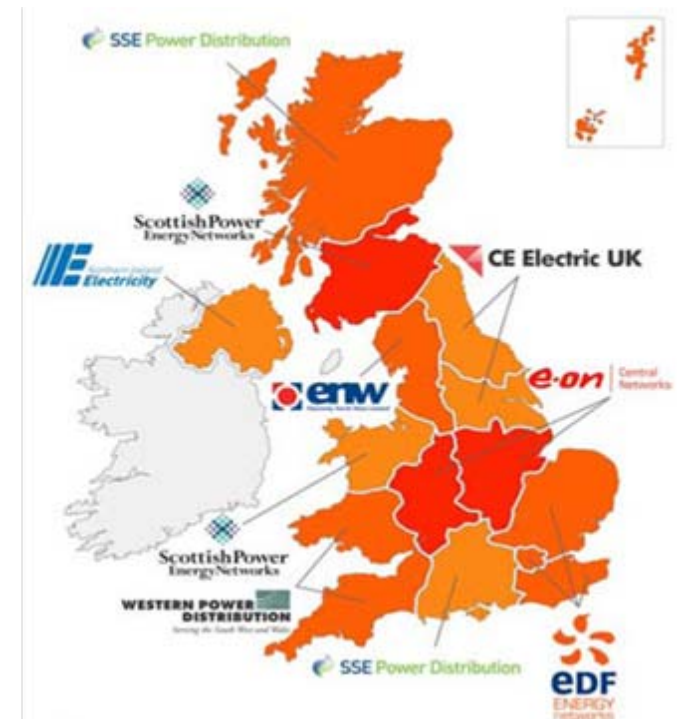
The UK grid is aging

- As highlighted by CE Electric's 'YEDL' Grid
- YEDL contains 199 medium-voltage substations
- 15 are seriously under threat and operate at over 95% of the fault capacity and so operate with restrictions
- FCLs solve this problem



Source ASL

YEDL - System rating in percentage of equipment rating





Commercial Advantages of the MBH

- High-efficiency superconductor coils: 50% reduced energy consumption
- Superconducting coils: improved heating quality - 25% increased productivity

Comparison: 0.5 MW heating requirement	Copper Induction Heater	MBH
Investment	€0.9m - 1.2m	~ €1.4m
Annual electricity savings	0	€50k - €300k
Productivity increase per annum	0	€200 - €2m



Management calculation based on performance data provided by customer "Weseralu"





Growing Order pipeline for MBH (Magnetic Billet Heater)

Date	Customer	Size	Country
Sept 2007	WeserAlu	Al 6"	Germany
Mar 2008	Wieland	Cu 16"	Germany
Jul 2009	Sapa	Al 16"	Italy
Oct 2009	NN	Cu 8"	Germany
Jan 2010	WeserAlu	Al 9"	Germany

- WeserAlu committed to convert fully to superconductors
- Sapa operates over 200 of the world's 5,000 heaters



Industrial Heating 09/08



Light Metal Age 04/09



Elektrowärme International 01/09



Heat Processing 08/09





Lightweight and compact generators
for renewable power generation



3. Renewable Energy

"We believe that the extraordinary electrical efficiency and power density enjoyed by superconductor wind turbines represent the most viable solution"

Pierre Bastid, CEO & President Converteam



Superconductor Generators for Wind and Hydro Power

- Superconducting coils replace copper coils yielding:
 - Generators 1/3 the size
 - Generators 1/6 the weight
 - Generators with ~99% energy efficiency
 - Generators with unbeatable 'part-load' performance

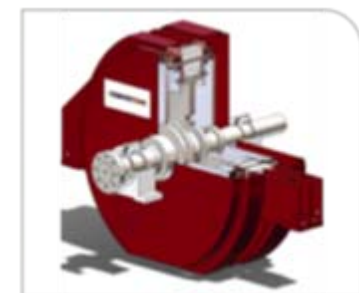


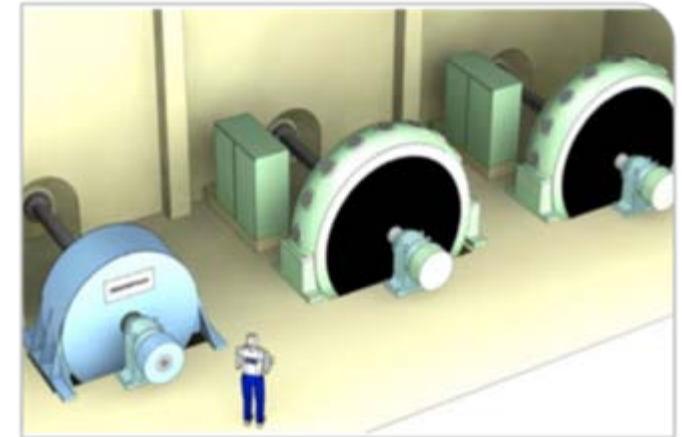
Image Courtesy of Convertteam



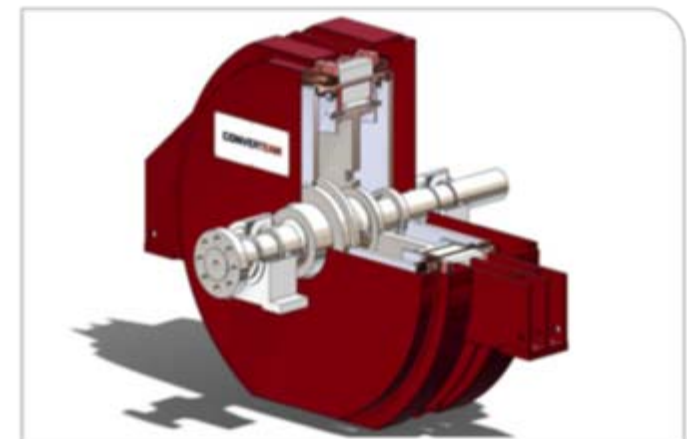


Hydro power – Increased electrical output

- Compact superconductor generators enable increased power production from existing run-of-river hydro plants
- World's first installation in E.ON AG commercial dam - spring 2010
- E.ON's Bavaria site will have 36% increased generator power output
- RWE order to evaluate 9 hydro sites with 36 generators
- Existing European replacement market for run-of-river hydro: 15GW



"The exceptional benefits offered by Zenergy's technology have the potential to pave the way for a new generation of electrical equipment"
Ulrich Fuchs, Head of Electrical Engineering, E.On-Hydro

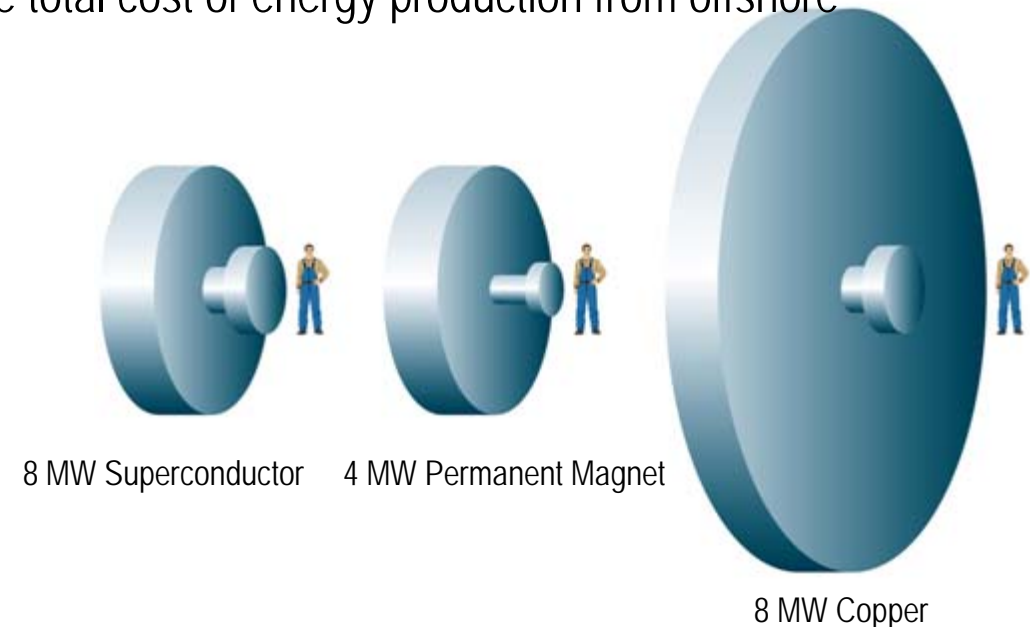


Wind power - Unbeatable Power Density

- Lightweight generators lead to significant reduction in material usage and lower production costs
- Superconductors enable practical removal of gearbox: Biggest cost of failure for offshore wind
- Majority of industry already moving to simpler gearbox and permanent magnet generator
- Permanent magnet not practical for high ratings or mass production
- Superconductor direct drive the ONLY next step
- Overall impact of superconductors: a 25% reduction in the total cost of energy production from offshore wind power

	Conventional 6MW	Superconductor 6MW
General diameter	9m	3m
Generator weight	450t	80t

For illustrative purposes only. These numbers are approximate and will vary depending on the nature of the wind turbine in question



We keep the lights on



Zenergy Power

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