powerstar®

Made in the UK with pride

Saving you up to 26% of your total electricity bill

ECO-FRIENDLY PRODUCT™

PowerStar® is an approved energy savings system. This product may qualify for an interest-free Energy Efficiency Loan from the Carbon Trust.

ESTA
energy services and technology association

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True voltage optimisation can ..

- ✓ Reduce energy consumption by up to 26.1%
- ✓ Reduce harmonics by up to 90%
- ✓ Improve power factor by up to 20%
- ✓ Improve the life expectancy of your equipment
- ✓ Protect against the potentially catastrophic effects of transients
- ✓ Provide absolute voltage phase balancing

Different technologies available?

But are they the same?

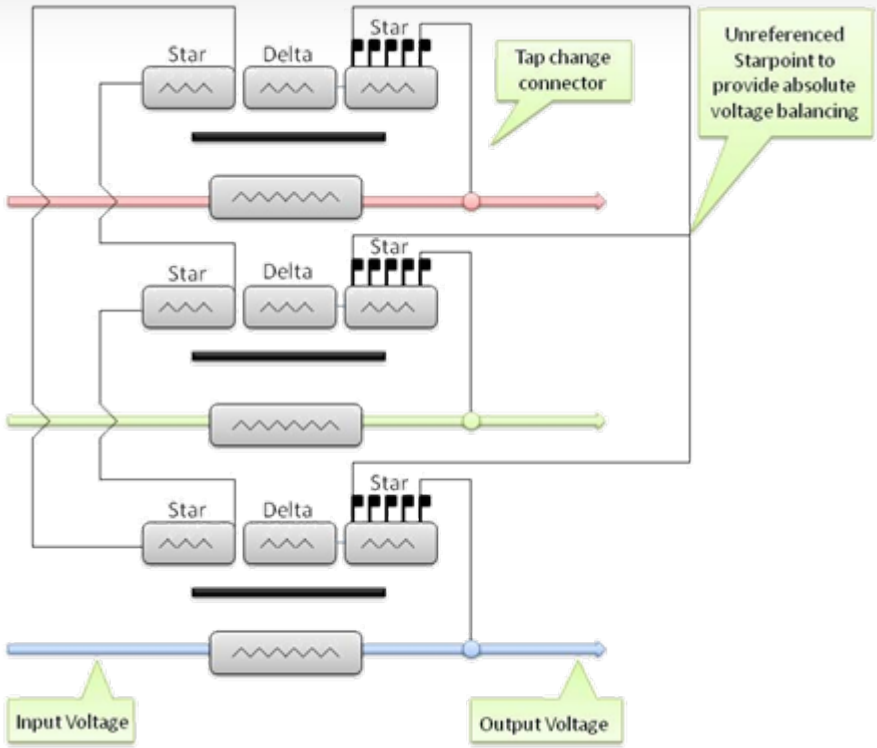
- **True voltage optimisers**
- **Variac devices**
- **Simple auto or step-down transformers**

Powerstar® Design

Unique Triple Wound System

1. **Harmonic elimination – Star configuration to eliminate harmonics**
2. **Delta configuration to further suppress harmonics**
3. **Star configuration to control voltage**

The design ensures extremely low impedance and low losses, example: The 1,000kVA Powerstar® has an impedance of 0.000178Ω and consumes a maximum of 300W (at 100% load).



Voltage reduction without harmonic mitigation

- An 8% reduction in voltage to 220V in a building with 4% voltage harmonics = ?
- A voltage as low as 212V
- Problems with lifts, IT, generators, lamp ballasts burning out etc

(Worsening) Power Quality issues …

- Harmonics
- Transients

“There is only 1 VO system available in the world”.

“Voltage optimisation is a silver bullet / a cure all … The Holy Grail”.

“A VO system can be anything other than transformer based”.

“Will voltage optimisation always reduce energy consumption?”

NO!

It works better on inductive loads (motors, lighting) than resistive loads and again depends on the loading of these inductive loads.

Therefore, it is important to understand the electrical loading characteristics of your site.

Examples

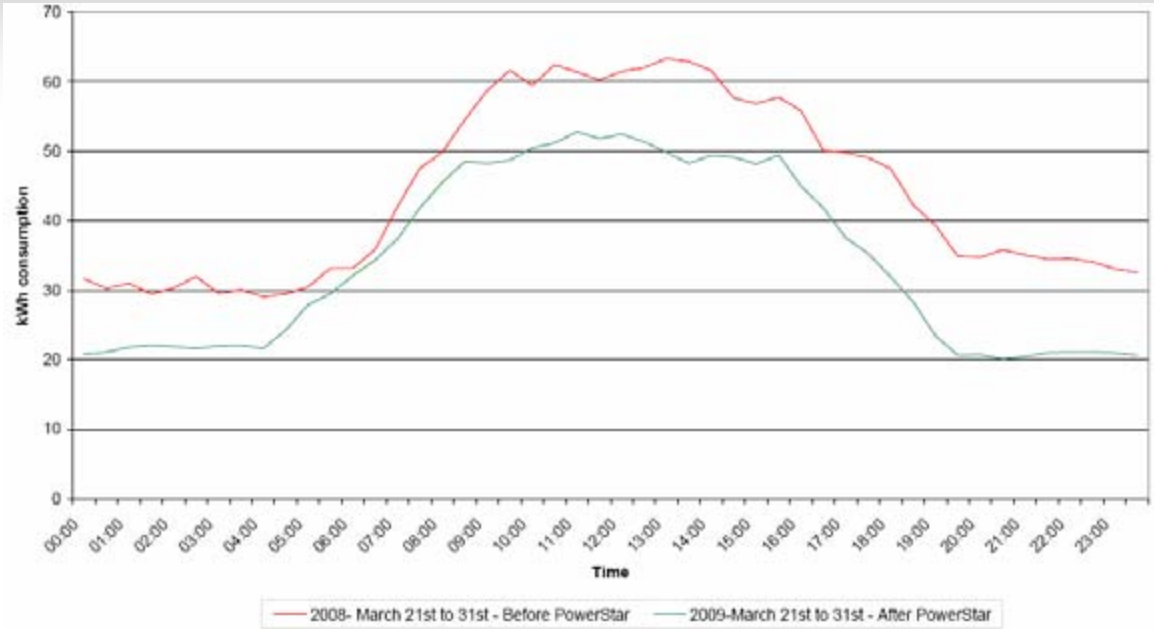
- Voltage optimisation achieves zero savings on high frequency (HF) Lighting.
- No savings on a kettle or similar immersed resistive loads.
- Less savings on motors with VSD controls
- Significant savings on motors which are not loaded at 100% of their capacity at 100% of the time.

It is therefore important to consider all potential energy saving projects within your organisation as voltage optimisation is only one of the tools you can use.

Case Studies …

- ✓ Hotels
- ✓ Public Sector
- ✓ Manufacturing
- ✓ Administration
- ✓ FMs
- ✓ Energy Supplier

Environment Agency



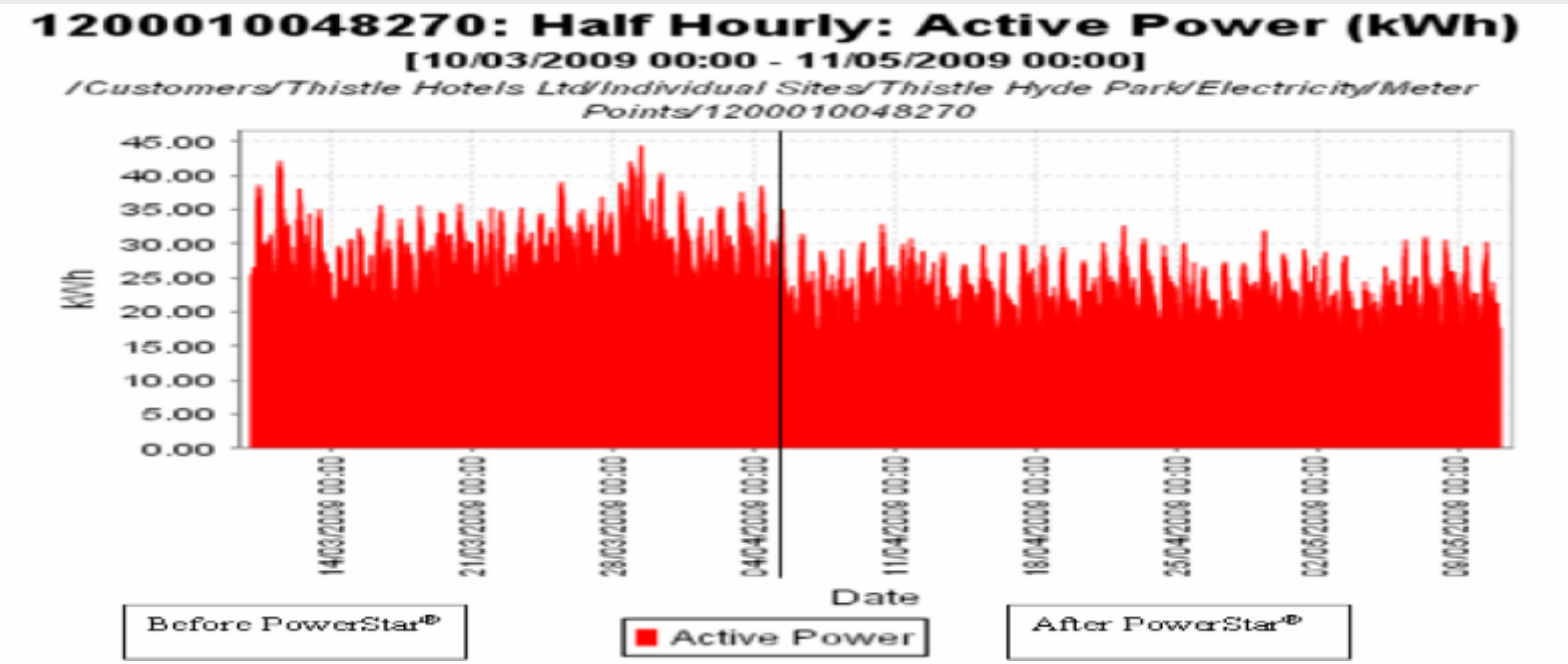
Payback: 1.0 years

Achieved Savings=22%
Predicted Savings=16%

PowerStar® at -20V	total	midnight to 7am	7am to midnight
Total before (kWh)	2,120.92	477.83	1,643.08
Total after (kWh)	1,648.27	380.73	1,267.55
Reduction (%)	22.28	20.32	22.86
Reduction (kWh)	472.64	97.11	375.54
Extrapolated (kWh)	172,515.04	35,443.71	137,071.33
Annual Saving	£ 13,801		

Environment Agency

Thistle Hyde Park Hotel - London



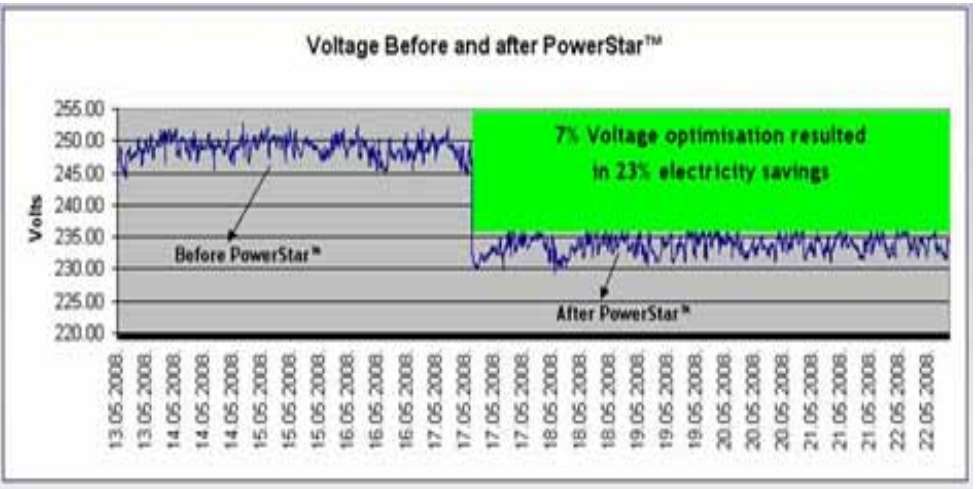
Payback: 0.8 years

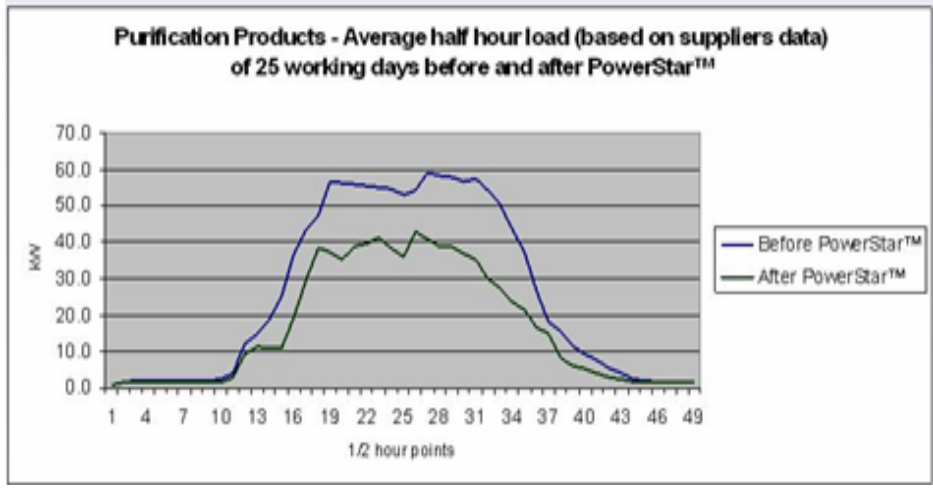
Achieved Savings=26%
Predicted Savings=17%

PowerStar® Installation Results	
Total Before (kWh) (24 days)	34355.3
Total After (kWh) (24 days)	25403.8
Savings (kWh)	8951.5
% Savings	26.1%
Extrapolated to yearly kWh	136137.396
Annual Savings based on 8p/kWh	£ 10,891

Case Study: Purifications Product Limited

"We have always strived to minimise the use of electricity and gas at our company; however most of our efforts related to non-productive items, such as lighting and heating. The installation of the Powerstar® system has reduced our total electricity consumption by almost a quarter (23%) and we are absolutely delighted" Quentin Mackenzie – Managing Director





A PowerStar® 300kVA unit powers the incoming supply to the factory. Power Consumption relates to motors running the paper line, Discharge Lighting, compressed air, extraction and small administration block.

Payback: 1.2 years

Achieved Savings=23%; Predicted Savings=15%

Case Study: Powerstar was commissioned in 120 of Punch Taverns' sites nationwide. A two-year installation programme commenced in March 2010.

- **Average savings of between 15 to 18% in energy consumption at each site.**

- **Worked flexibly with Punch to ensure that the units were installed with no disruption to the operations at each pub site.**

- **The installation schedules were worked around business demands and as manufacturers of the equipment, units were tailored specifically for each site, taking into account any size and location restrictions.**

"Powerstar has been the single most effective project in saving energy that Punch Taverns have invested in and we will be installing Powerstar in at least 80 of our properties this year alone. Punch Taverns have a great responsibility towards the environment and overall Powerstar will assist us in reducing our carbon footprint by more than 20%, which we are delighted with".

Andy Barrett, National Facilities Manager, Punch Taverns

“Powerstar voltage optimisation has been a major part of our comprehensive energy efficiency programme. It is perhaps the simplest and most effective way to instantly save energy and therefore we would highly recommend Powerstar systems”

Mark Orpin, Head of Energy Management at Asda

“We would highly recommend Powerstar voltage optimisation systems. The Powerstar installation at Scott Clinic, Mersey Care NHS Trust has achieved an 18% saving on total electricity consumption. This is an excellent result which is helping the hospital to meet its CO_2 reduction targets. Powerstar voltage optimisation has shown that significant savings can be achieved without compromising the operations of the hospital”

Mark O'Grady, Managing Director, MITIE Engineering (North) Ltd

"As part of our efforts to achieve the highest efficiency rating for our buildings, Powerstar has been installed to three leisure centres within the council. The results have been exciting with an average of 12.5% reduction in the three leisure centres."

Martin Perrow – Energy Manager, Cornwall Council

"So far the Powerstar installations in our hotels have achieved as much as an amazing 26.1% saving in total electricity consumption at our Thistle Hyde Park Hotel and elsewhere, never less than an 11.5% saving. That's what I call a real result!"

David Hannah, Head of Property at Guoman Hotel Management (UK) Ltd.

"Powerstar in particular and voltage optimisation equipment in general deserves to be higher up the business and political agenda and possibly needs to be if the UK is to achieve our targeted CO_2 emission reductions."
Chris Rea, AESSEAL Managing Director

"The purpose of this project was to reduce our energy consumption at the National Metal Forming Centre. This has been achieved with the installation of the Powerstar system which has cut energy costs by 21% ... which is impressive.

We were promised 14% savings and we verified 21% over 18 months. The professionalism of EMSc and the speed of supply and installation were also impressive and we would highly recommend this technology to those which can be benefited."
Dr Alan Arthur, Director, Confederation of British Metal Forming (British Metal Forming Centre)

Expectation matching …

Pay-back will depend on voltage and eligible load and remember, no two buildings are the same.

- Promise 8% saving and deliver 9% …..

Or

- Promise 10% and deliver 9%

Or

- Post voltage loggers, promise almost everybody that 13% savings are possible and then use software to try and prove it's been achieved.

We are Engineers, not a mail-order solution!

Thank you …

Please come and speak to our Engineers on Stand 10