ECO:nomics
A LOWER CARBON FOOTPRINT AT NO EXTRA COST

National PLC

ARMSTRONG

Product value Streams

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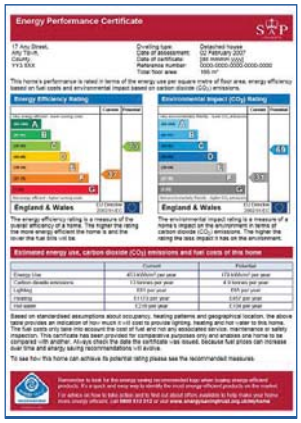
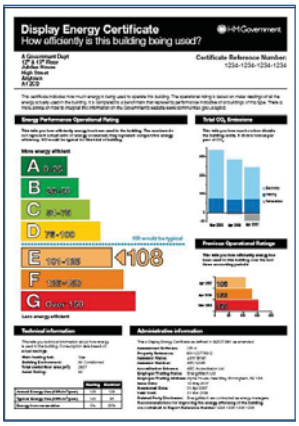
National PLC is a company that has large premises on multi site locations over the UK, such as supermarkets; DIY stores; department stores etc etc.

National PLC's have not only a large on-going build programme but also a legacy of historic buildings with all the implications of energy wastage with old mechanical products.

New legislation an public awareness means it is important that energy conservation is explored with implications to large savings on energy costs and greater profits.

Armstrong want to show that 'GREEN' should not impact on reliability, installation costs and more importantly profits.





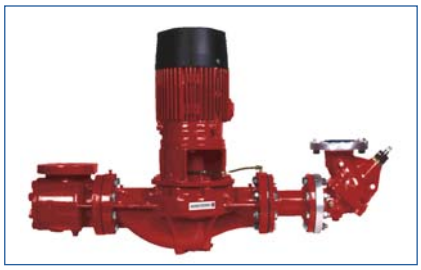
At Armstrong we have carried out some initial research in the National PLC sector of business and our understanding of problems are:

National PLC problems	National PLC Business Implications
High energy costs together with power available in existing buildings	Long term high running costs & low profits with unavailable power for building upgrades
Difficulty in retrofit installation of new products and product integration in systems	Long and expensive retrofit installation programme with unreliable system dynamics
High Maintenance costs and life cycle costs	Long term high running costs and low financial return
Complience with CO2 reduction legislation and providing high impact to DEC/EPC certificates	Non complience to legislation and not attractive to green aware customers
Unaware of new energy efficient products and specialist companies tend to be small	Full potential energy product savings not realised and reliance on small companies will impact on long term back up

▶ What National PLC's Needs

- ▶ Lower energy costs– high profits and more available power for internal upgrade
- ▶ Low maintenance Costs– High profits
- ▶ Guarenteed system performance
- ▶ Energy legislation complient and attractive to customers
- ▶ Proven product history with full back up

▶ Armstrong Benefits for National PLC companies

Products	Description	National PLC Benefits
IPP–Ultra efficient Chilled Water Plant		
	IPP is a fully integrated chiller incorporating best in class plant automation controlling variable speed pumps, chiller and condenser pumps to achieve COP in excess of 7. This extraordinary energy saving chiller offers lowest life costs/space saving and maintenance costs	▶ Up to 60% energy savings with dramatic effect on EPC Certificate and running costs. ▶ Best 1st install costs and Easy to retrofit with components on existing plant with dramatic space savings up to 40%. ▶ Oilless compressors-VIL pumps combined with optimum running regeme = 50% maintenance savings ▶ Life Cycle costs 35% lower than conventional plant means greater public spending on local services
MBS– Integrated Heating		
	The Armstrong MBS is a fully integrated heating system for medium sized applications. The modular design means that it can be assembled in 45 min. The optimised controls combined with variable flow condensing boilers offers 95% efficiency	▶ The most energy efficient boiler system on the market with large NOX savings– Dramatic effect on EPC Certificate ▶ MBS is quite simply the easiest retrofit solution, installation in 45 mins and plug and play. ▶ As a packaged system Maintenance is core benefit. ▶ Operating costs are industry lowest
Vertical In-Line Pumps		
	The Vertical In-line pump is one of the most efficient and space saving products in the market.50% Install savings with no inertia bases; vibration mounts or flexible connectors. Seals can be changed in 30 min without the need to remove motor.	▶ Reduction in plant room piping combined with impellor shaving to load adds to 40% energy savings ▶ 40% space saving compared to conventional base mounted pumps ▶ Open seal arrangement gives 40% maintenance savings ▶ 10% life cycle costs compared to conventional pumps
IVS Sensorless Pumps		
	Completely integrated pump/drive/ control system. Eliminates costs for wall mounted VFD and wiring and is self controlling - A truly remarkable and industry leading product.	▶ Can save 70% of energy consumption @50% flow– Drastic improvement for EPC Certificate ▶ Very easy to retrofit and no base requirements. ▶ No maintenance required on critical components. ▶ Reduces life cycle costs by up to 65%
IPS Pumping Control System		
	Pre-engineered factory built pumping control system– No BMS system could achieve the level of energy management. Configered for each specific project requirements and will save on design and components.	▶ Up to 70% saving compared to constant flow systems, large reductions in EPC rating ▶ Simple addition of VFD's and IPS is quick and easy way to retrofit and modernise a whole system.

IPC
Retrofit Case Study

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Humber College's Ultra-Efficient Plant Controller

This all-variable speed plant exceeded the specification for energy efficiency by enabling an optimal match of equipment operating speed/load while using the least amount of energy

Project Background and Requirements

Humber College required a genuine commitment to sustainability while at the same time allowing capacity for future expansion of the campus facilities – a 40% increase in total cooling load.

Armstrong Solution

The Humber design employs an all-variable speed [3 chiller plant (550 tons each)] dual-fuel generator sized to service one chiller for electrical demand management, and an all-variable speed chilled water plant automation solution [referencing the Hartman LOOP® as the basis of design]. The final design utilizes pre-fabricated pump stations [automated pump packages] with controls and electrical fully integrated in the assembly, for both chilled water (CHW) and condenser water (CW) circuits. Consequently, the plant layout went full-variable as its primary configuration. The overall design utilizes Armstrong's Integrated Plant Control (IPC 11550) system with Hartman LOOP® control technology. This IPC system is accessible both locally and via the web using an icon-based touch-screen and downloadable data log.

Ease of use and monitoring ability are important to the college for the purposes of assessing the performance of their capital investment, and also for the local utility that contributed funding for the net reduction in annual kW-hrs.

To further centralize data access, the IPC system is also directly linked to the existing building automation system (BAS).

** Note: The 0.58 kW/ton plant performance was achieved before the third chiller was upgraded to variable speed.*

ENERGY IMPACT

Plant performance before the retrofit	1.1 kW/ton
Plant performance after the retrofit	0.58 kW/ton*

MAIN EQUIPMENT

Chilled Water Pump Skid c/w	3 x VIL Pumps Suction Guides (3x) Flo-Trex valves (3x) Master IPC 11550 Panel IPC 5500 chiller panel
Condensed Water Pump Skid	3x VIL Pumps Suction Guides (3x) Flo-Trex Valves (3x) ITC 3600 Tower Panel

18" Vortex Separator, Evapco Cooling Towers

Technical Details

Chilled Water Pumps: 1320 USGPM at 260 ft each

Condenser Water Pumps: 1280 USGPM at 93 ft each

PROJECT FACTS

Communication Protocol	Siemens BMS protocol BacNet
Plant Automation	IPC 11550 with Hartman Loop®
Plant Performance	0.58 kW/ton (COP > 7.5)*

Project Value		% Performance
Best First Installed Cost	• •	The total installed cost is reduced by taking advantage of factory-design and factory pre-fabrication.
Installation Savings	• • •	Less time required on site as this is a factory commissioned system
Installation Advantage	• • •	Contractor, logistical and administrative costs are reduced.
Project Risk Minimization	• •	Powerful risk management tool for performance and warranty risk
Improved Energy Efficiency	• •	Averages a 0.58 kW/ton plant efficiency; 50% reduced electrical consumption
Improved Maintenance	• •	Operating the equipment at lower loads and lower speeds than traditional control methods will reduce maintenance requirements
Life Cycle Cost	• •	Optimized through a combination of lowered energy costs, lowered maintenance costs, and an equal or lower first installed cost.
Best Practice	• •	The IPC automation system with built in monitoring and email alarm function protects the asset
Improved Comfort	• • •	Comfort is improved through minimized equipment staging.

▶Case Studies on existing projects available
▶Energy Calculation tools available to show payback/ profit expectation
▶White Papers

Our policy is one of continuous improvement. We reserve the right to alter our dimensions and specifications without notice.

EXPERIENCE BUILDING...

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