

Windsor FlashPac™ Electric Steam Battery Boiler Range



Windsor Energy is a trusted world class supplier of sustainable process heat to the industrial sector globally, with an extensive installed base of heat plant and a commitment to drive continuous improvement in its product range.

Background

Windsor now offer an electro-tech solution to transition from fossil fuel boilers to an electric steam battery suitable for the 0.5-5 MWth market.

The FlashPac™ combines an electric resistive boiler and a steam accumulator into one piece of equipment, to minimise site footprint, simplify electrical controls, reduce the number of pressure vessels and associated piping, valves and instruments.

This industrial energy storage system decouples electricity supply and steam demand, which allows optimisation of power upgrades and energy costs.

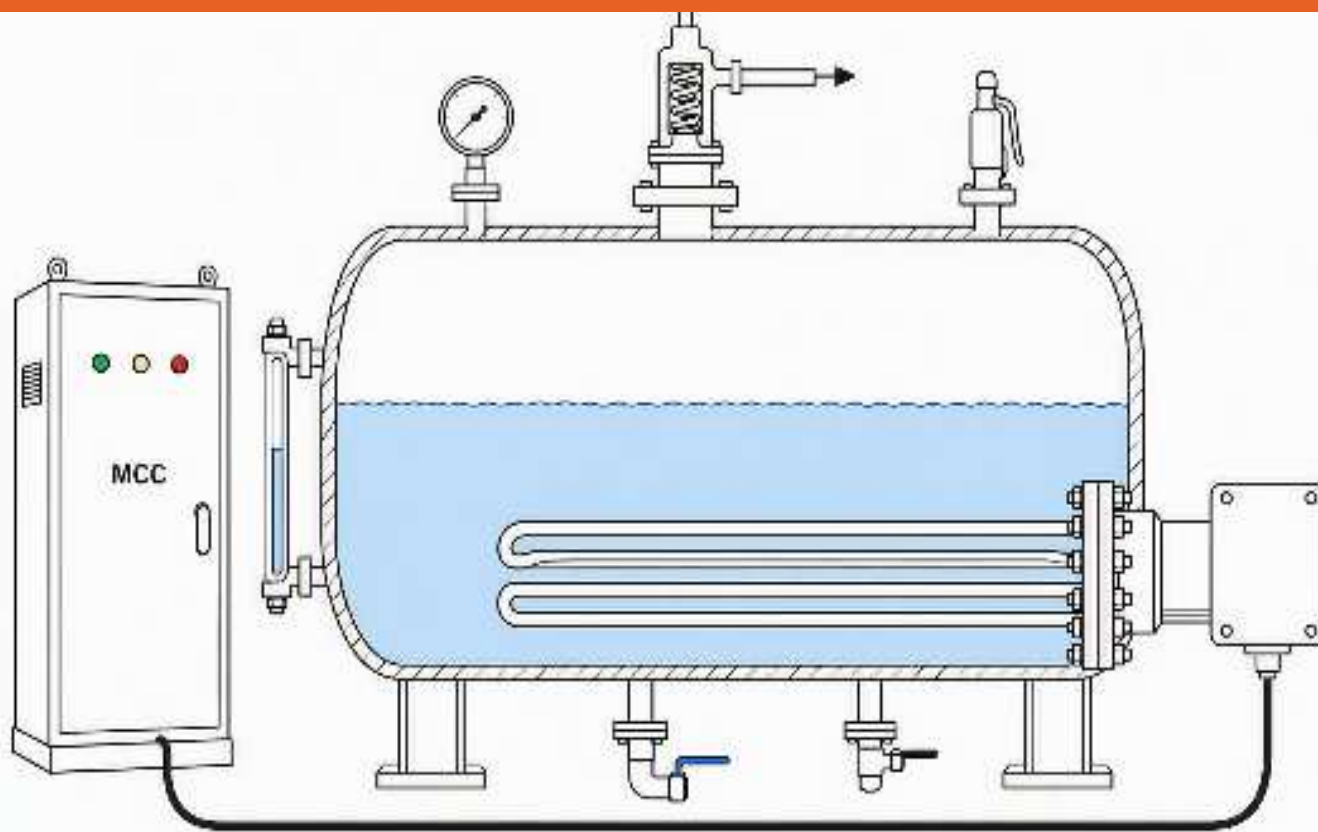
Benefits

- No water demineralisation plant required – can use standard fired boiler chemical dosing
- Avoid, or reduce, lines upgrades, and associated lines charges, due to minimised peak power consumption
- Energy storage allows site electricity costs to be reduced through minimising peak energy charges and peak lines charges, by charging up with low-cost off-peak power and participating in energy flexibility markets
- Durable, low-maintenance design due to minimal components and moving parts
- Zero onsite emissions with no flue or requirement for resource consent
- Innovative plant design for high efficiency, simple operation, high availability and low overall cost of ownership

Features

- High net thermal efficiency >99%
- Windsor designed pressure vessel, fabricated by our partner in Thailand or in our workshop in Porirua, Wellington
- Turndown ratio of approx. 30:1
- Element bundles are easily removed and individually replaced
- Valves, instruments, feedpumps and motors sourced from global brands with local support
- Boiler suitable for outdoor installation (excludes switchboards)
- Guaranteed to meet or exceed all NZ requirements and inspections
- Switchboard can include ICP to facilitate favourable electricity contracts

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Simplified FlashPac™ diagram for illustration purposes only.

FlashPac™ Management System (BMS)

- Allen Bradley CompactLogix PLC
- Schneider Magelis 10.4" HMI touch screen
- Optional data register and ethernet cable for interfacing with Client's site SCADA system
- Protects the integrity of the vessel from damage
- Complies with unattended operation in accordance with the NZ Boiler Code of Practice, for minimal operator resourcing
- Solid state power control with no mechanical contactors, providing precise power modulation and enhanced reliability

Site Works

- **Components:** Optional balance of plant includes, feed tank, hotwell, blowdown tank, piping integration
- **Installation:** Windsor can deliver a full turn-key installation, or provide an experienced construction supervisor for a client-managed project
- **Commissioning:** **Following installation,** an experienced Commissioning Engineer will commission the plant
- **Training:** Operator training is recommended during the commissioning and testing period



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Decoupling Energy Supply from Steam Demand

The FlashPac™ Electric Steam Battery decouples energy supply from steam demand. The figures below illustrate four common operating scenarios of how this steam battery can be used to suit the application.

Furthermore, demand response can also be integrated should it be financially favourable.

Figure	Scenario	Benefit
1	Constant Supply, Batch Demand	Minimal grid upgrade
2	Constant Supply, Peak Demand	Minimal grid upgrade
3	Solar Supply, Constant Demand	Lower energy costs
4	Off-Peak Supply, Constant Demand	Lower energy costs

Constant Electric Supply

The FlashPac™ can convert a constant low power supply into a reserve of thermal energy which can provide high-pressure steam when required to meet a multiple batch per day steam demand, or a single shift peak steam demand. This is illustrated in Figures 1 and 2 below. The advantage of this approach is zero to minimal upgrade of the electric supply to meet a larger peak steam load.

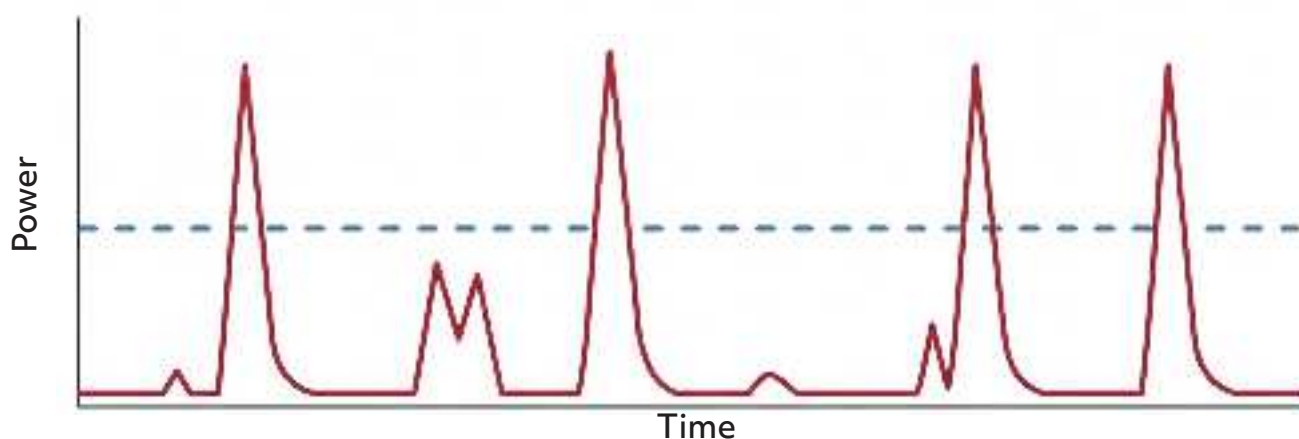


Figure 1: Constant Electric Supply & Multiple Batch Steam Demand

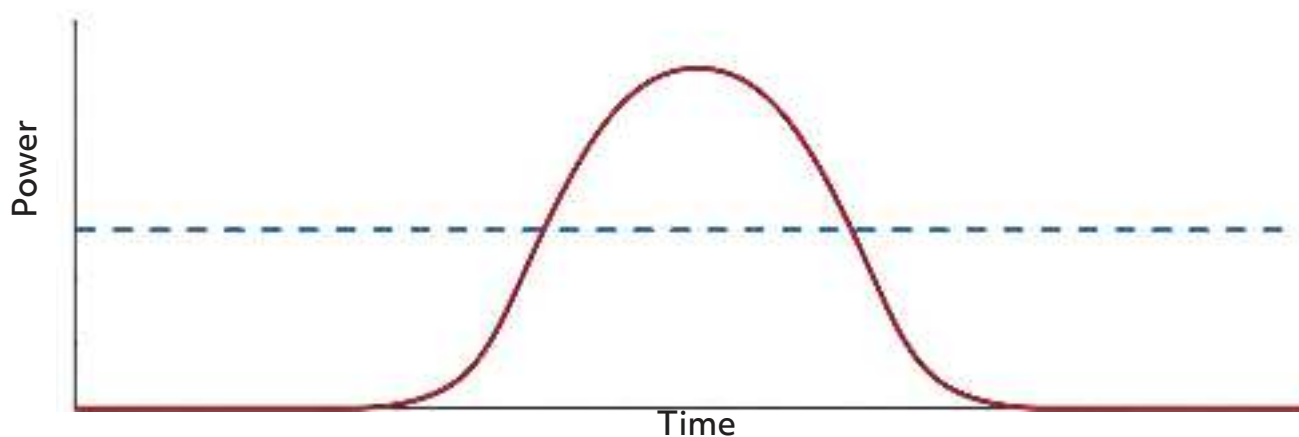


Figure 2: Constant Electric Supply & Single Shift Peak Demand

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Constant Steam Demand

The other approach is to use the FlashPac™ to meet a constant steam demand with a variable electricity supply, such as charging with low-cost solar power from onsite generation as illustrated in Figure 3 or to avoid charging in periods of high energy charges or high network pricing, due to constrained energy supplies or network supplies respectively, as illustrated in Figure 4. The advantage of this approach is to minimise energy costs which can be a significant saving.

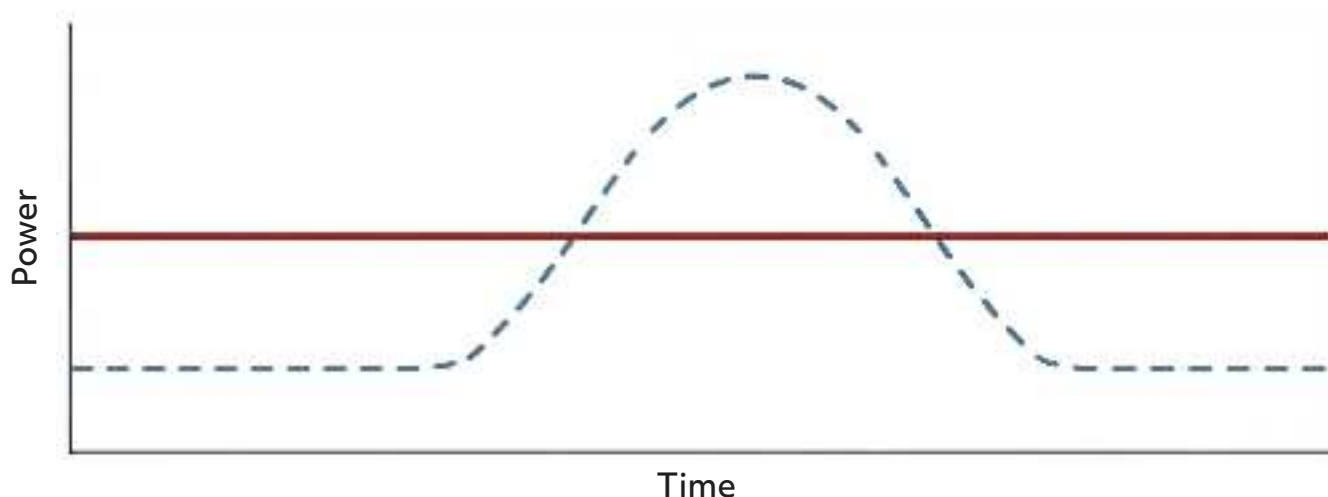


Figure 3: Solar Supply & Constant Steam Demand

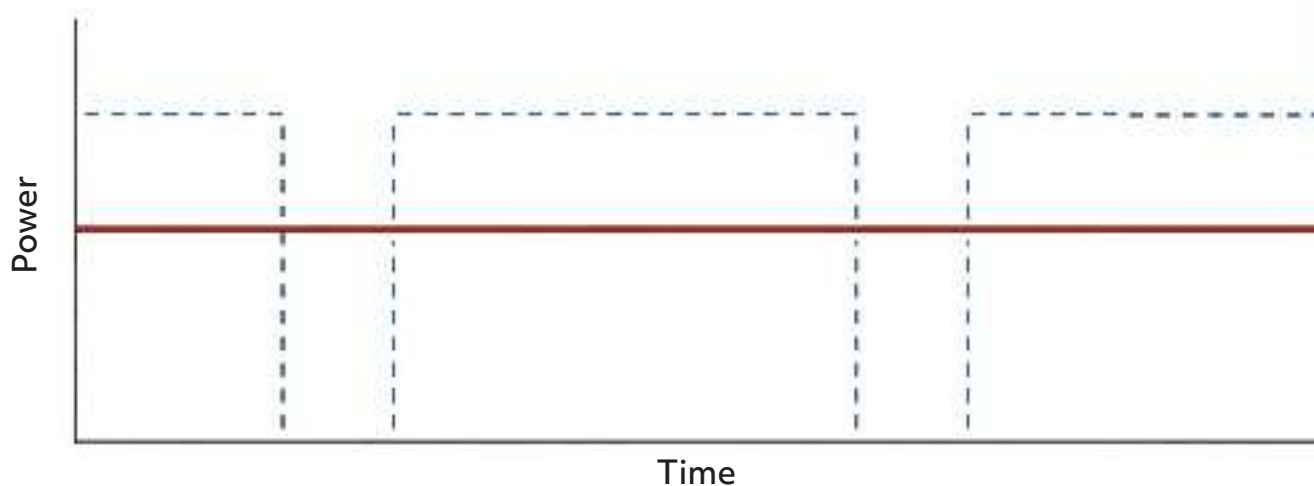


Figure 4: Off-Peak Electric Supply & Constant Steam Demand

The FlashPac™ is a flexible product with varying capacity and storage options. Windsor will optimise the FlashPac™ to suit your steam profile and available electrical power, to find the lowest lifetime costs of the FlashPac™ energy system.