

CASE STUDY:

Obtaining a SARS Section 12L Tax Rebate for Improving Kiln Efficiency by Replacing Clamp Kilns with Habla Zig-Zag Kilns



Background

Swisscontact (Swiss Foundation for Technical Co-operation) funded this work as part of their EECB (Energy Efficient Clay Brick) project. The objective of the EECB project is to increase energy efficiency and reduce greenhouse gas emissions in the South African clay brick sector.

The Habla Zig-Zag Kiln (HZZK) is an energy efficient and environmentally friendly brick firing technology, invented in German and further developed in Australia.

The fire in the HZZK moves through stationary bricks in a zig-zag fashion creating air turbulence allowing for even heat distribution and maximum heat generation. The heat is moved ahead of the fire to pre-dry green bricks before full-firing.

The case study was conducted on the HZZK at Worcester Bakstene.

What is a SARS 12L tax rebate?

The SARS 12L tax incentive reduces taxable profit by 95 c/kWh (or equivalent kWh in the case of fuel such as coal) of energy savings.

At the current company tax rate of 28 %, the value of the rebate is $0.28 \times 0.95 = 0.266$ R/kWh. The rebate is tax deductible based on the verified savings for a period of one year.

The purpose of this rebate is to encourage increased energy efficiency by providing tax rebates for verified energy savings projects.

What are the steps to follow to qualify for the Section 12L tax rebate?

SARS section 12L makes provision for tax rebates for improved efficiency. Rebates will only be given if the resulting savings can be accurately quantified. For the brick kilns it is necessary to measure:

- Fuel and electrical energy into the kiln,
- Brick production (for baseline adjustment).

The following procedure describes the 12L tax incentive process:

1. Register the project online with SANEDI (South African National Energy Development Institute); SANEDI will evaluate project viability at no cost,
2. Establish an energy baseline for the kiln/s (in most cases coal or other fuel consumption) over a one year period – this work has to be done by a SANAS (South African National Accreditation System) accredited M&V (Measurement & Verification) body,
3. Project approval by SANEDI (by email),
4. SANAS accredited M&V body verifies savings (over one year post project implementation period) before being sent to SANEDI for final approval,
5. Once approved, SANEDI will issue a tax certificate to the brickworks.
6. Tax certificate is sent to SARS to claim for the Section 12 L tax rebate.

Timing and procedure are important, a section 12L tax rebate is paid on:

- ✓ Energy consumption before implementation of savings activities minus energy consumption after implementation,
- ✓ Energy savings over a one year period.

Applications for section 12L tax rebates can be made by the brickworks, or by an energy service company (ESCO) such as Grey Green acting on their behalf.

Viability

If you are interested in applying for a 12L tax rebate, these are the preliminary steps to follow:

- Contact an ESCo for an initial project feasibility for the 12L tax rebate,
- If the rebate is feasible, an M&V body is appointed,
- The M&V body will do a site inspection and determine the best methodology for determining the coal consumption for the kiln/s.

The M&V body will decide on a suitable baseline and measurement period (this can be up to 12 months – the duration can vary).

Every batch of fuel delivered must come with a certificate (from a SANAS accredited laboratory) showing the calorific value.

Contact Grey Green for M&V methodology plan options.

Additional Tips

A pro-active approach is to modify fuel storage and handling systems a year prior to starting with a HZZK project. This will:

- Help ensure that a section 12L application is successful,
- Spread the Capex (capital expenditure) requirements over a longer period which is good for cash flow.

Due to the need for one year's worth of data before changing from clamp kilns to HZZKs, it is important to start the process early – i.e. 18 months before the planned shut-down of a clamp kiln.

Design should cater for M&V: wherever possible, ease and accuracy of measurement should be part of the design of the HZZKs. Including the necessary features at design stage results in a lower cost than adding them afterwards.



Financial Projections

A brief comparison of the clamp kilns and the HZZK at Worcester Bakstene is below.

Comparison of Clamp Kilns & HZZK

Parameter	Clamp Kiln	HZZK	Savings (%)
SEC, firing only (MJ/kg fired brick)	3.99	0.74	~82
Annual cost of fuel (R)	R 5.8 million	R 1.03 million	
Annual energy consumption, firing only (equivalent kWh)	37.9 million	7 million	

Notes:

- The fuel used at Worcester Bakstene is not typical. Thus, the numbers in the table above are what they would be if Worcester Bakstene used coal.
- Coal savings are a calculation of what could be achieved.
- Coal costs were taken as 923 R/tonne, including transport.
- All costs exclude VAT.
- The HZZK's heat recovery drying mechanism was not being used when the kilns energy monitoring was conducted. Noting this, the HZZK's SEC of 0.74 MJ/kg could be further decreased.

The financials for the SARS 12L tax rebate are:

12L Tax Incentive Financial Analysis

Annual equivalent energy savings (kWh)	30.9 million
Effective tax rebate (R/kWh)	0.266
SARS Section 12L tax rebate (R)	R 8.2 million

The total capital cost of the HZZK was approximately R 4.5 million and the cost of M&V as well as the coal calorific value tests is estimated at about R 400 000. Thus:

- Without a SARS Section 12L rebate, payback period will be less than a year.
- The tax rebate will return much **more** than the cost of the kiln to the brickworks.

HZZKs have several more advantages relative to clamp kilns. Perhaps most important is significantly decreased waste.

Conclusion

As shown in this case study, obtaining a SARS section 12L tax rebate will result in a significant reduction of future tax payments. The SARS 12L tax rebate is 174 % greater than the cost of the HZZK plus M&V.

➤ Hence it is very lucrative to do everything possible to obtain the SARS 12L tax rebate.

Improved kiln efficiency also results in reduced coal usage, and therefore carbon tax will be less.

Please also note that labour requirements may change and the scrap rate will likely decrease.

A special thanks to:

