

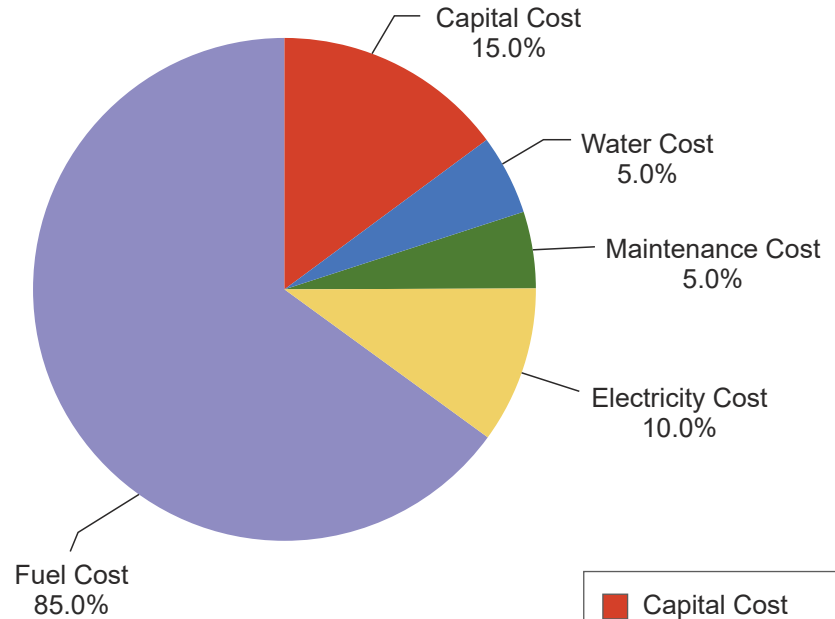
# Efficiency Manager for Oil and Gas Fired Boilers

EffiMax™

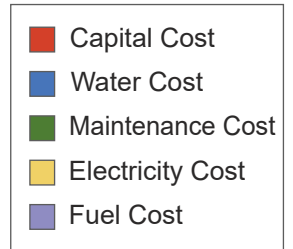


# EffiMax™

## Cost of Operation Oil / Gas Fired Boilers



Pie 1.



The cost of a boiler is negligible as compared to the amount spent on fuel to operate the boiler year on year. Fuel costs are majorly determined by boiler efficiency. Buying an efficient boiler does not guarantee high efficiency.

Surveys reveal that operating efficiency of unmonitored boilers lag behind the rated efficiency by 5-15%. The first step towards improving boiler efficiency is to be aware of its current operating efficiency. The Forbes Marshall EffiMax™ boiler efficiency monitoring system helps to reduce steam costs by monitoring and analysing performance and controlling parameters to improve overall efficiency.

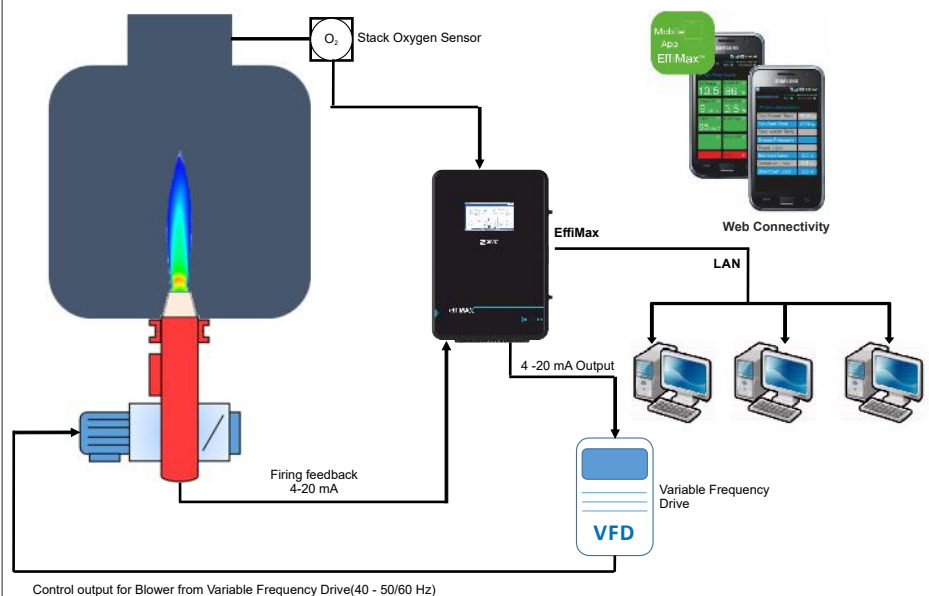
Optimising efficiency not only reduces boiler fuel consumption, and thereby steam cost, but also the quantum of harmful emissions. This contributes significantly towards a lower carbon footprint and clean and sustainable production goals.

Boiler efficiency is an important parameter in the boiler specification when buying a new boiler. However, little attention is given to it once the boiler is steaming. The myth is that the boiler will always continue to generate steam at the rated efficiency. The truth is that one of the most critical parameters in boiler operation is its delivered efficiency in actual operation. What distinguishes one boiler from another is actually at what cost steam is generated.

The EffiMax™ boiler efficiency monitoring system provides real time insights on key parameters that help to establish boiler specific standard operating procedures. This not only bridges the efficiency gap but also helps sustain performance over the entire operating life of a boiler.

Measured Parameters	Calculated Parameters	Control Parameters for EffiMax 4000
Steam flow	Boiler efficiency	Oxygen trimming
Fuel flow	Steam to fuel ratio	
Steam pressure	Stack loss	<b>Optional</b>
Steam temperature	Blowdown loss	Drum level
Stack temperature	Enthalpy loss	Water tank level
Ambient temperature	Radiation loss	Deaerator level
Feed water temperature	Blowdown quantity	Deaerator pressure
% O <sub>2</sub> in flue gas		
Blowdown TDS		

## The EffiMax System



## EffiMax Mimic



## Features

Touch screen display for instantaneous display of all boiler parameters that impact boiler efficiency

Online boiler efficiency measurement with break up of losses (as per BS845)

Graphical analysis of boiler performance metrics

Boiler performance diagnostic reports with alarms

Web based remote performance monitoring

## Benefits



**Fuel Bill Reduction**



**Sustain Improved Performance**



**Tuning of Equipment**



**Implementation of Corrective Actions**



**Establish and Track Key Performance Indices**



**Generating SOP for Efficient Boiler Operation**



**Identification of Corrective Action in Boiler Operation**

## Boiler House Digital Sustenance Service

It is critical to ensure that high efficiency boilers run at peak efficiency across all loads. The Boiler House Digital Sustenance service helps to monitor, analyse improve and sustain performance of the boiler house. Data on key parameters is continuously collected from the EffiMax™ system installed on the boiler to the Forbes Marshall Cloud.

There is continuous analysis of the S:F ratio, boiler efficiency, other important key performance indicators and safety parameters. Actions are recommended based on the analysis to ensure that the boiler is maintained at maximum efficiency with an uptime of 95% and zero incident operation of the boiler house

## Payback - Minimum 3% Efficiency Improvement

Boiler Capacity (TPH)	Oil Savings (Domestic)		Oil Savings (International)		Gas Savings (Domestic)		Gas Savings (International)	
	₹Lacs/annum	Payback (Months)	\$ / annum	Payback (Months)	₹Lacs/annum	Payback (Months)	\$ / annum	Payback (Months)
2	23	8	35640	8	36	8	32640	9
3	41	4	63576	5	54	6	48960	6
4	51	4	79200	4	72	4	65280	5
5	64	3	93600	3	90	3	81600	4
10	129	1	194400	2	180	2	163200	2
15	199	1	302400	1	270	1	244800	1



### Basis of Calculations

#### Oil

Efficiency improvement from 80 - 83%

GCV = 10,100 kCal/kg

Cost = ₹ 58 per kg

#### Natural Gas

Efficiency improvement from 79 - 82%

GCV = 9600 kCal/Nm<sup>3</sup>

Cost = ₹ 75 per Nm<sup>3</sup>

Operating hours per annum = 8000

The above prices are average prices prevailing in India in 2022

## EffiMax in Action

A large bulk drug manufacturer installed the Effimax 4000 to monitor the efficiency of their 20TPH oil fired boiler.

The EffiMax indicated huge stack losses. Adjustments were made in the operations, and the following benefits recorded.



**Boiler Efficiency**  
Increase by 6%



**Fuel Consumption**  
Reduction by 25,000 litres of oil per month



**Impact to Environment**  
CO<sub>2</sub> reduction of 734 tonnes per year,



**ROI**  
> 3 months



**Boiler Efficiency**  
Increase by 3%



**Fuel Consumption**  
72,000 litres of oil per year



**Impact to Environment**  
CO<sub>2</sub> reduction of 79 tonnes per year,



**ROI**  
> 4 months



Forbes Marshall  
Krohne Marshall  
Forbes Marshall Arca  
Codel International  
Forbes Vyncke  
Forbes Marshall Steam Systems

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