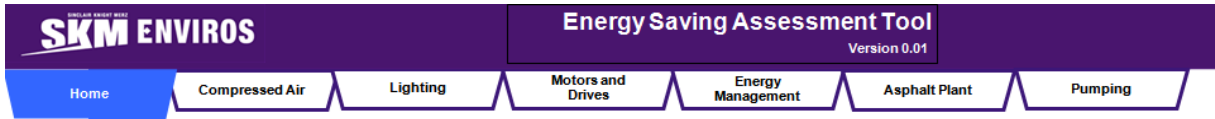


User Guide for the Energy Saving Assessment Tool (Version 0.01)



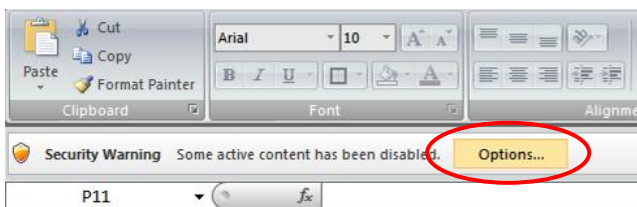
Client Carbon Trust

The following paragraphs give an overview of the Energy Saving Assessment Tool (Version 0.01). This tool is designed for use within the Aggregates industry sector and aims to help users assess the energy saving potential of a site.

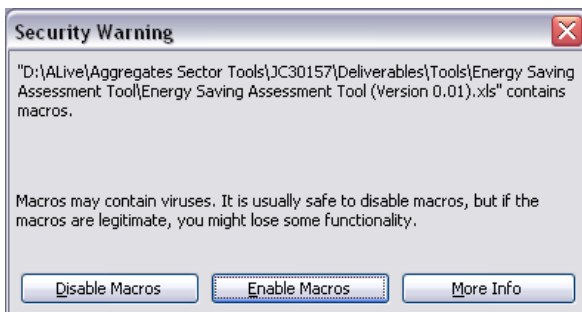
Enable macros:

For the tool to function it is necessary to enable the macros.

In Excel 2007 a Security Warning bar will appear right above the formula bar. Click the button 'Options...' and then select 'Enable this content' and click OK.



In earlier versions of Excel a Security Warning dialogue box will appear. Click Enable Macros to continue.



Enter site information:

The home page of the tool is shown below:

Energy Saving Assessment Tool
Version 0.01

Home | Compressed Air | Lighting | Motors and Drives | Energy Management | Asphalt Plant | Pumping

This tool is designed to provide a quick assessment of the energy saving potential based on the information provided by the user and on rules of thumb

Your Name: Go to the Summary Table Locked calculation cells:

Annual Asphalt Production: tonnes Data entry cells:

Enter your Annual Consumption Data in the table below										
Utility	Amount	Units	Tariff	Tariff Unit	Convert to kWh	kg of CO ₂ /kWh	kWh	£/kWh	CO ₂ (tonnes)	Cost (£)
Grid Electricity	150,000	kWh	0.09	£/kWh	1	0.537	150,000	0.09	80.6	£13,500
Natural Gas	245,000	kWh	0.025	£/kWh	1	0.185	245,000	0.03	45.3	£6,125
LPG	0	litres	7.1	£/litres	0	0.214	0	0.00	0.0	£0
Gas Oil	0	litres	10.9	£/litres	0	0.252	0	0.00	0.0	£0
RFO	0	litres	10.6	£/kWh	0	0.252	0	0.00	0.0	£0
Fuel Oil	0	litres	11.9	£/kWh	0	0.268	0	0.00	0.0	£0
Coal	0	kg	7.472	£/kWh	0	0.33	0	0.00	0.0	£0
Choose Utility	Choose Unit	Choose Tariff	0	0	0	0.00	0	0.00	0.0	£0

Energy Usage and Cost by Utility				
Utility	kWh	£/kWh	Cost	CO ₂ (tonnes)
Grid Electricity	150,000	0.09	£13,500	80.6
Natural Gas	245,000	0.03	£6,125	45.3
LPG	0	0.00	£0	0.0
Gas Oil	0	0.00	£0	0.0
RFO	0	0.00	£0	0.0
Fuel Oil	0	0.00	£0	0.0
Diesel	0	0.00	£0	0.0
Petrol	0	0.00	£0	0.0
Coal	0	0.00	£0	0.0
Total	150,000		£13,500	80.6

Clear All Entries from Calculators

On this page the user is asked to enter the annual energy consumption figures of the site. A number of different utilities (Grid Electricity, Natural Gas, LPG, Gas Oil, RFO, Fuel Oil and Coal) are available. The user can choose in which units he wants to enter the amount of energy as well as the tariff for each utility. The available units for amount of fuel / energy and units of tariffs depend on the fuel in question. The user can remove utilities by clicking on the 'Remove entry' cell.

The tool has default values for converting all energy / fuel units to kWh and to CO₂ equivalent emissions. The user has the option to overwrite these values, but also to use the defaults again by clicking on the 'Default energy factor / CO₂ factor' cells.

All the entries are aggregated on the table at the bottom of the page. This page is not editable – it updates automatically.

The legend on the Front Page (adjacent image) shows which cells are for entering data and which are used for calculations.

Locked calculation cells:

Data entry cells:

Energy Technology Areas

The tool is broken down to 6 different Energy Technology Areas (Compressed Air, Lighting, Motors & Driver, Energy Management, Asphalt Plant and Pumping). These can be accessed from the buttons on the top of the Front Page (picture shown below).

Energy Saving Assessment Tool
Version 0.01

Home | Compressed Air | Lighting | Motors and Drives | Energy Management | Asphalt Plant | Pumping

Each Energy Technology Area has a number of calculators. Enter the information required on the light blue cells (**Data entry cells:**) and the tool will do the calculations.

The SKM logo trade mark is a registered trade mark of Sinclair Knight Merz Pty Ltd.

An example of a calculator is shown below:

This calculator helps to assess the energy saving potential of reducing the pressure of the compressed air. Each calculator has text with information about each respective technology area and a fact that highlights the amount of the energy saving potential of each area.

The required information for this calculator is the reduction of pressure in bar and the cost to implement this reduction. The tool will calculate the Annual energy and cost savings and the payback period.

Note: Please note that for the calculators on the compressed air page only, the user will be asked to enter the estimated energy consumption of the air compressors or if that is not known, information about the air compressors so that the tool can estimate it. Also, some of the calculators within the Asphalt Plant need the annual asphalt production which needs to be entered on the Home Page.

Pressure Reduction	
Reduce Pressure by	<input type="text" value=""/>
Cost to reduce pressure	<input type="text" value=""/>
Annual Energy Savings	<input type="text" value="0"/> kWh
Annual Cost Savings	<input type="text" value="£0"/>
Payback period	<input type="text" value="0.00"/> years (~0 months)

(i) Info
 All compressed air systems have a minimum operating pressure that is necessary for the equipment installed in the system to function correctly. When a higher pressure than necessary is applied, the system will consume more. Don't compress air to pressures higher than is necessary. Check the requirements of your equipment and tools, set the system pressure to the minimum needed.

(i) Fact
 For a typical screw compressor operating at 7bar(g), for every 0.5bar drop in pressure, the compressor will require 3-4% less energy.

Note: This is for calculating approximate savings based on rule of thumb:
 * Reducing the operating pressure by 0.5 bar improves efficiency by
*(based on air at 7 bar)

The table below shows the calculators within each Energy Technology Area:

Energy Technology Area	Calculator
Compressed Air	<ul style="list-style-type: none"> ■ Pressure Reduction ■ Air inlet temperature reduction ■ Air leaks ■ Heat recovery from air compressors
Lighting	<ul style="list-style-type: none"> ■ Reduced lights and switch off ■ Install occupancy sensors ■ Energy efficient light fittings
Motors & Driver	<ul style="list-style-type: none"> ■ VSD for fans and pumps ■ VSD for conveyors ■ Switch off equipment
Energy Management	<ul style="list-style-type: none"> ■ Monitoring energy usage ■ Raising energy awareness ■ Motor planning
Asphalt Plant	<ul style="list-style-type: none"> ■ Insulation of Dryer Drum ■ Reduced clean outs ■ Burner efficiency ■ Asphalt Plant Stock pile management ■ Optimising mixer throughput ■ Stone temperature control ■ Bitumen Tank Heating Control ■ Insulating bitumen tanks and lines
Pumping	<ul style="list-style-type: none"> ■ Reduce pumping head ■ Improve pump efficiency ■ Improve motor efficiency

The SKM logo trade mark is a registered trade mark of Sinclair Knight Merz Pty Ltd.

Summary Table

The results from all the calculators are summarised in the Summary Table. This table can be accessed from the Home Page by clicking on the button 'Go to the Summary table' (adjacent image).

Go to the
Summary Table

To access the table the user will first need to enter the name of the person who identified the opportunities. This is needed later to populate the Opportunities Database with the 'Owner' of the opportunity. However, this can be changed at a later point.

The following information is shown in the Summary Table:

- Title
- Description
- Technology Type
- Utility Type
- Utility Saving (kWh)
- Cost Saving (£)
- Status
- Owner
- Capital Cost (£)
- Payback (years)
- CO₂ Savings (tonnes CO_{2e})

This table can be printed by clicking on the button 'Print Summary Report' (adjacent image).



Clear Entries from calculators

There are two ways to clear the entries from the calculators:

- There is a 'Clear Calculator' button in each of the Energy Technology Areas. This will clear the entries from the particular calculator
- There is a 'Clear All Entries from Calculator' button on the Home page. This will clear all entries from all calculators.



Export Opportunities to the Opportunities Database

Select this Opportunity

The opportunities can be exported from the Assessment Tool to the Opportunities Database if you are using this. There is an option to select which opportunities to export by ticking the relevant tick box to select / deselect individual Opportunities (adjacent image).

This can be done by hitting the button 'Copy selected Opportunities to Database' (adjacent image). Select the Opportunities Database in the file browser that will appear.

Copy selected
Opportunities to Database



When the right file is chosen a dialogue box will ask for the Group and the Site that the identified Opportunities apply to. Enter this information by selecting the appropriate Group and Site from the drop down lists and hit OK. The drop down lists will show the Groups of Sites and the Sites that are currently in the selected Opportunity Database. If you can't find the Group / Site you need please make sure that these are created in the Opportunities Database.