

Energy Efficiency Checklist

Coffee manufacturers

Cost-saving measures, productivity
enhancements, and optimisation
opportunities

The Energy Efficiency Checklist is a practical guide for coffee manufacturers to help the industry establish energy efficient opportunities. It has been developed as part of the Sector Decarbonisation Programme, which is a joint initiative between the Energy Efficiency & Conservation Authority (EECA), and the New Zealand Speciality Coffee Association.

This checklist sets out both low and high-cost energy efficient opportunities which can be taken when embarking on a process towards lowering your onsite emissions.

There are seven different sections focusing on:

1. Measuring Energy Intensity
2. Energy Maintenance
3. Production Planning
4. Bean Storage, Loading, and Cooling
5. Roasting Chamber
6. Afterburner
7. Other

Before you start this guide, you can set the foundations and start with purpose by:

1. Putting in place a climate action plan with regular feedback from stakeholders and staff around how to improve your performance
2. Assign energy management responsibilities to staff
3. Maintain an updated action list of energy efficient opportunities
4. Meet regularly and report on actions – provide the opportunity for staff feedback

TASK	DETAIL	COMPLETE?
Measure energy intensity	Gather your utilities bills (ask your energy company to provide a monthly report).	
	Use EECA's Energy Intensity Calculator for the coffee sector to measure the energy intensity per kg of coffee roasted.	
Basic energy saving maintenance	Conduct energy awareness training for staff, to promote efficient energy use within the business.	
	Switch off equipment when not in use, either manually or programmed – smart plugs can also be used where appropriate.	
	Implement appropriate scheduling to regularly perform basic energy maintenance.	
	Check temperature sensors are calibrated, clean and in good condition.	
	Check insulation is in good condition on pipes and equipment.	
	Review possibility to perform dry ice cleaning of internal roaster and pipework, recommended quarterly.	
	Undertake regular flue cleaning, recommended monthly.	
	Clean underneath the cooling tray daily.	
	Conduct burner maintenance on a regular basis by a qualified technician.	
Production planning	Use EECA's Energy Intensity Calculator monthly to identify optimisation successes	
	Minimise downtime between batches.	
	Review options to have longer roasting days and the possibility to have non-roasting days.	
	Review opportunities to optimise roasting profiles and timing without impacting quality.	
	Optimise roasting schedule, moving from light roast to darker roast during the roasting period.	
	Ensure optimum batch sizing for the roasting equipment, challenge the thinking of smaller is best.	
Green bean storage	Measure green bean moisture content.	
	Store green beans at conditions that promote drying (away from direct sunlight and kept dry).	
	Look at optimum moisture content range (eg. 9-12%).	
Green bean loading	Optimise bean transfer and conveying to reduce damage and dust creation.	
	Review options for a green bean cleaner to remove dust.	
	Review options for a colour sorter to remove defect beans.	

TASK	DETAIL	COMPLETE?
Roasting chamber	Inspect and reduce air in-leakage into the chamber by ensuring roaster is well insulated.	
	Optimise the combustion air to fuel gas ratio, this may require support from a service technician.	
	Review automatic software solution.	
	Adjust target temperature profile for thermometric lag in chamber.	
	Inspect cleanliness of drum and ducting.	
	Review internal drum condition and outsource external service technician support.	
Bean cooling	Depending on cooling tray design, ensure bed depth is not too deep (0.075-0.1m).	
	Consider how bean blending is performed and if this can be more energy efficient.	
	Review options to cover cooling tray to reduce heat loss from roasting chamber.	
	Ensure afterburner is optimised to suit requirements.	
	Verify afterburner is running as it should be and within specification.	
	Review possibility to look at heat recovery. Can heat be reused/repurposed e.g space heating.	
	Check insulation is in good condition.	
	Review opportunities to include filters.	
	Review alternative methods to clean air (water recovery/scrubber).	
	Review opportunities to consult with local councils. Consider smell vs CO ₂ .	
Other	Review converting lights to LED.	
	Review opportunities to procure electric forklifts.	
	Review opportunities to procure hybrid or EVs for deliveries.	
	Review opportunities to repurpose the waste chaff such as worm farms or compacted into bricks.	
	Review opportunities to reduce truck movements <ul style="list-style-type: none"> Is it possible to hold extra stock? Can the driving routes be optimised? 	

