

YOUR COMPETITIVE ADVANTAGE

Energy efficiency solutions for Australian transport and logistics SMEs



Fact sheet no.1

Energy efficiency for road transport operations

This fact sheet provides basic information about energy efficiency in freight vehicles.

It is one of six fact sheets and other resource material developed by the Supply Chain and Logistics Association of Australia (SCLAA) and project partners to help SMEs in the supply chain and logistics sector with energy efficiency improvements and energy cost reductions.

The full suite of resources is available from <http://energy-efficiency.sclaa.com.au>

Obtain expert advice

To help identify the most suitable opportunities for your business, consider obtaining advice from a professional energy auditor or your supplier. Whilst an audit will come at a cost, it can save you both time and effort, and ensure you invest in the most beneficial opportunities.

► Key factors in energy consumption

Energy in transport is mostly about fuel consumption. For most in the supply chain and logistics sectors, fuel constitutes the biggest energy cost, but it is also a major part of overall operating costs (up to half for some fleet operators). In short, energy efficiency is about reducing costs and therefore improving your business.

ENERGY = FUEL = \$\$\$

The energy a truck uses in moving freight depends on many factors. The two most significant are the type of truck, and the duty cycle in which the truck is used.

- **Type of truck** determines its physical size, payload capacity, overall weight, the size and power of the engine, and the kind of loads it is likely to carry. These factors contribute to the total energy required to move the truck at the required speed. There is a diversity of truck configurations used in Australia: the traditional 'box' body and trailer, along with many other configurations (e.g. flat beds, concrete mixers, cranes). Even within the first category (two axle rigids) there are many sub-segments, with the smallest using less than half the fuel of the largest.
- **Duty cycle** is a description of how a truck is used. Typical descriptors include speed, load, terrain and the frequency of braking or stops. These factors have a large bearing on energy (fuel) use (e.g. high vehicle speed produces aerodynamic drag; frequent stopping

requires subsequent acceleration; and long periods of idling represent non-productive running)

The industry already uses a kind of shorthand to describe a truck's duty cycle. For example, a truck used in local pick-up and delivery is understood to run short trips, most often in urban environments, involving frequent stops. A truck used in regional linehaul or interstate linehaul involves predominantly high-speed running, few stops, and mostly uncongested roads.

There is a natural fit for particular kinds of trucks in specific applications because they are a better fit for purpose; but there is also overlap between categories.

► The importance of fleet profile

The combination of different truck configurations and different duty cycles means that what works on one truck (to improve fuel efficiency) may not have the same results on another truck. There are few generic opportunities that apply to all trucks.

When analysing the fleet for opportunities, it is therefore important to group similar vehicles together and consider them separately.

► Strategies to reduce energy costs

From a fleet management perspective, there are a few strategies to improve fuel efficiency. These include:

- operating existing equipment more efficiently
- improving the specification of equipment
- replacing existing trucks with new trucks.

Table 1 covers the kind of technology and operational changes operators can make to existing fleets, and the maximum fuel savings they could expect to achieve

Most small to medium businesses do not have the option of purchasing new trucks because the up-front cost is too high. However, upgrading to near-new second hand vehicles can bring many of the benefits (fuel savings up to 10%) without the high costs. Features to look for when buying new trucks are shown in Table 2.

Table 1: Maximum fuel savings (%) by vehicle type*

Proposed fleet improvement actions	Ute/van	Rigid truck	Semi-trailer	B-double	Road train
Replace Old Fleet With Newer Trucks					
Replace old trucks with newer, more efficient models	10	10	10	10	10
Use hybrid in urban areas		20			
Fuel-Efficient Equipment					
Auxiliary power systems		1	1	1	1
Low-rolling resistance tyres	2	5	6	6	6
Auto tyre inflation/monitoring	1	4	4	4	4
Improved aerodynamics (vehicle and trailer)		10	8	12	10
Lightweight body/trailer	2	2	2	3	4
Behavioural Change & Freight Practices					
Eco-driving	10	15	15	10	2
Idle reduction	5	8	4	2	1
Load consolidation	4	10	10	5	5
Off-peak freight movements		10	10	10	
Preventive maintenance	5	5	5	5	5
Good tyre maintenance	3	5	7	10	10
Optimise route/schedule	10	15	15	10	
Reduced top speed	2	5	5	5	7
Streamlining (remove roof racks, aerials, etc.)	2				

*The maximum fuel saving achievable will depend on current equipment/practices (the baseline), the application in which the truck is used and supplier/equipment used.

Table 2: Things to look for when buying new

Engine specification	Drivetrain specification	Body/chassis	Electronic/info systems
Smaller size, turbo charged diesel engine	Intelligent transmission (Automated Manual Transmission, Direct Shift Gearbox, dual-clutch)	Auxiliary power systems	Predictive cruise control
Variable displacement Turbo compound	Battery-electric hybrid Stop-start systems	Aerodynamic fairings	Acceleration/speed control Driver info systems
Variable air compressor			
Variable speed oil/water pump			
Smart electric ancillaries (power steering, air-conditioning, refrigeration)			

► **More information**

Case Study No.2 - McGills Transport

Transport company case study

<http://energy-efficiency.sclaa.com.au>

Ecostation Fleet Assessment Tool

Tool for developing a fleet baseline of fuel and emissions, as well as fleet structure

<http://www.ecostation.com.au/ReducingEmissions/>

Green Truck Partnership

Trials of fuel-efficient technology under the Green Truck Partnership

www.rms.nsw.gov.au/heavyvehicles/greentruck/

Fuel for Thought

A federal government resource (under the EEO program) identifying energy saving opportunities in the road and rail freight sectors

<http://eex.gov.au/files/2012/03/Fuel-for-Thought.pdf>

Smartway Transport Partnership

A US program to reduce fuel use and emissions from the freight transport sector – similar to NSW Green Truck Partnership in that it tests fuel-saving equipment

www.epa.gov/smartway/

Green Vehicle Guide (for light commercial vehicles)

The Green Vehicle Guide helps you by rating new Australian vehicles based on greenhouse and air pollution emissions

www.greenvehicleguide.gov.au

Fleetwise

Provides information on energy efficiency improvements for light vehicle fleets

<http://www.transport.vic.gov.au/research/sustainability/fleetwise>

Truck buyers' guide (for heavy commercial vehicles)

This guide can help you consider the things you should look at in striving to choose a truck that both suits your needs and provides the best fuel economy.

www.truckbuyersguide.gov.au



Opportunities - Road Transport

Overview of energy efficiency opportunities across road transport

<http://eex.gov.au/industry-sectors/transport/road-transport/opportunities/>

Energy Efficiency Opportunities (EEO) program information for the transport sector

The Energy Efficiency Exchange website supports the implementation of energy efficiency practices within medium and high energy-using companies.

It shares best-practice information on energy efficiency, case studies and resource materials from Australia and overseas.

www.energyefficiencyopportunities.gov.au/industrysectors/transport/

The following are private sites. SLCAA does not endorse these sites but are supplying the links for user reference only.

Ausfleet

Fleet management software

<http://www.ausfleet.net/Products.aspx>

Air CTI

Fleet management (aerodynamics)

<http://www.aircti.com/>

ThreeX Australia

Fleet management software

<http://www.threex.com.au/vehicle-tracking-about.aspx>

Eco-driving safely for trucks

Short factsheet covering eco-driving tips

http://www.iru.org/cms-filesystem-action?file=mix-publications/Ecodriving_truck.E.pdf



Learn more on how to make your business more energy efficient at sclaa.com.au

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