12. Premium Unleaded Petrol Summary

12.1 Introduction

The study brief requires an examination of Premium Unleaded petrol (PULP), which is a 95 RON fuel meeting either the Euro II specification for unleaded petrol or the fuel specifications for PULP proposed by the Commonwealth for implementation in 2002. It is assumed that this fuel does not contain ethanol and that it is used in light vehicles as defined in ADR 79/00 and 79/01. Our analysis treats PULP as a reference fuel against which to compare ethanol blends. Our analysis is thus based on a hypothetical vehicle that satisfies Euro 2 tailpipe emissions.

The difference between ULP and PULP is determined by differences in octane rating. PULP blend typically contains larger proportion of high octane streams, i.e those containing aromatics, isoparaffins and naphthenes.

Upstream emissions in petrol production arise from oil recovery, transportation and processing. Further emissions derive from the distribution through the retail network.

12.2 Results

Because PULP is treated as a reference fuel, its results are used as a basis of comparison for petrohol and for anhydrous ethanol in the following chapters.

12.3 Viability and Functionality

Petrol is the most common automotive fuel, and unleaded petrol has been in use in Australia since 1986. Manufacturers produce premium unleaded petrol and its use does not cause warranty problems. Vehicle operational range depends on the size of the fuel tank, but typical values for a four or six cylinder car range from 400 to 600 km.

All forms of petrol are considered hazardous according to Worksafe Australia criteria, more so than diesel fuel. Petrol has an extreme flammability rating and extreme chronic effect rating. It has moderate toxicity and body contact ratings.

12.4 Health Issues

A typical material data safety sheet will note that unleaded petrol is highly flammable; harmful by inhalation, in contact with skin and if swallowed; possibly carcinogenic; and may cause damage to health from prolonged exposure.

12.5 Environmental Impact and Benefits

ESD

Ecologically sustainable development (ESD) is based on the principles of equity, efficiency and ecological integrity. The modern western economy is based on petroleum products, of which petrol, unleaded petrol, and premium unleaded petrol are examples. Though substantial arguments can be advanced that such an economy is not sustainable, in the sense that fossil fuels constitute a non-renewable resource, over the past three decades exploration activity has continually discovered new hydrocarbon reserves. In addition, the current concern over climate change has highlighted the burning of fossil fuels as one of the main causes. Thus

even if one argues that the fossil fuel economy is economically efficient, it is more difficult to argue that it encourages equity or ecological integrity.

Sustainability

The sustainability of petrol depends on the sustainability of the crude oil from which it is refined. Australian oil reserves are, or soon will be in decline. There will either be increased reliance on imports or there will need to be fuel substitution. This means that sustainability of petrol is dependent on global oil supplies.

Groundwater contamination

Petrol is refined from crude oil. Spills of crude oil, especially during transport in oil tankers at sea, pose an environmental hazard that contaminates marine life and bird life. Environmental damage from petrol itself can also occur, especially from leaks, at service stations and refuelling depots, which have been known to contaminate groundwater supplies.