Pacific Community
Communauté du Pacifique

Review of fuel subsidies in Kiribati

The Energy Programme,
Economic Development Division of
the Pacific Community

Review of fuel subsidies in Kiribati

This report was prepared by the Energy Programme,
Economic Development Division of the Pacific Community

Pacific Community
Communauté du Pacifique

Suva, Fiji, 2017

Original text: English

Pacific Community Cataloguing-in-publication data

Review of fuel subsidies in Kiribati / prepared by the Energy Programme,
Economic Development Division of the Pacific Community

1. Fuel — Kiribati.
2. Fuel — Taxation — Law and legislation — Kiribati.
3. Fuel — Taxation — Kiribati.
4. Fuel — Prices — Kiribati.
5. Energy consumption — Kiribati.
6. Electricity — Kiribati.

I. Title II. Pacific Community

662.6099681 ACCR2

ISBN: 978-982-00-0959-2

Table of contents

Acknowledgements

The author would like to thank the Energy Planning Unit, Ministry of Public Works and Utilities of Government of Kiribati for their support in making this research possible. Many thanks go to Ueaniti Kiritimati from the Energy Planning Unit for practical arrangements and support relating to the study. The author would also like to thank all interviewees and organisations who provided information and data for the research, and Laurie van der Burg from the Overseas Development Institute, along with other peer-reviewers for their valuable comments and feedback.

Abbreviations

ADO	Automotive diesel oil
AUD	Australian dollar
AusAID	Australian Agency for International Development
Avgas	Aviation benzene
CO_2	Carbon dioxide
COP21	Conference of Parties 21 in Paris in December 2015
CPI	Consumer Price Index
FOB	Free on board
G20	Group of 20 of the world's major economies
GFS	Government Financial Statistics
GHG	greenhouse gas
GIZ	German Agency for International Cooperation
GSI	Global Subsidies Initiative
HIES	Household income and expenditure survey
IEA	International Energy Agency
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
ITP	IT Power Group
KCCS	Kiribati Copra Cooperative Society
KCMCL	Kiribati Copra Mill Company Limited
KNSO	Kiribati National Statistics Office
KOIL	Kiribati Oil Company
KSEC	Kiribati Solar Energy Company
LPG	liquefied petroleum gas
MELAD	Ministry of Environment, Lands, and Agricultural Development
mogas	motor benzene
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of the Petroleum Producing Countries
PIC	Pacific Island country
PICTs	Pacific Island countries and territories
PPA	Pacific Power Association
PUB	Public Utilities Board
SE4All	Sustainable Energy for All
SOE	state-owned enterprise
SPC	Pacific Community
TJ	terajoule
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VAT	value added tax
WTO	World Trade Organization

Executive summary

International studies have found that billions or even trillions of dollars are being spent globally to subsidise consumption or production of fossil fuels. The International Monetary Fund (IMF) estimated global post-tax subsidies on energy to be 4.9 trillion USD in 2013, equivalent to 6.5 per cent of global gross domestic product (GDP). This estimate includes the negative external impacts of energy consumption, such as on air quality and climate. At the same time, the international community is working towards reductions in greenhouse gas emissions, emitted particularly by the consumption of fossil fuels. Subsidies on fossil fuels increase the volume of fuels produced and consumed, in turn, increasing greenhouse gas emissions. According to IMF, eliminating post-tax energy subsidies would cut global greenhouse gas emissions by over 20 per cent. It has also been widely acknowledged that subsidies on fossil fuels have the potential to create economic inefficiency and encourage wasteful consumption (IEA; OPEC; OECD; World Bank, 2010).

This report analyses fuel subsidies in Kiribati. It attempts to quantify the subsidies on the three most important fuels in Kiribati – benzene, diesel and household kerosene – using a methodology called the price-gap approach. This method gives rough monetary estimates of subsidies, but is relatively simple to apply and has low data requirements. The subsidies were estimated for 2011–2015, where data were best available, but applying the present day tax regime for estimation instead of the tax regime prior to the 2014 tax reform. This is because the objective of the study was to evaluate the effectiveness of current, not past, subsidy policies.

Kiribati is a country that is highly dependent on fossil fuel imports. All petroleum products, such as diesel, benzene, kerosene, and lubricants are imported into Kiribati and made up 26 per cent of the total value of imports in 2013, slightly exceeding the export value of all goods and services from Kiribati. The main uses for the imported fossil fuels are land, sea, and air transport; cooking; lighting; and the generation of electricity. This makes Kiribati vulnerable to changes in international oil prices. Since subsidies on fuels increase their consumption, they also make countries more dependent on oil and more vulnerable to volatility in international prices. The use of renewable energy, such as solar power, has been increasing in recent years but is still fairly modest in Kiribati. There appears to be potential for increasing the share of renewable energy in the country's energy mix. However, there are concerns that subsidies on fossil fuels may give them an unfair advantage and defer investment in renewable energy.

The main policies to subsidise the consumption of fuels in Kiribati are price controls and tax reductions. Prices of benzene and kerosene are controlled by a price ordinance. Diesel is not formally included in the ordinance but the data suggest that in practice the price of diesel is controlled as well. The prices appear to be subject to political decision and for fuels, unlike for other price-controlled goods, there does not appear to be a pricing formula. Tax reductions include VAT exemption for all fuels and exemption of excise on kerosene and diesel supplied to the Public Utilities Board (PUB) for electricity generation. The excise rates on benzene and diesel were found to be too low to cover the full cost of the negative impacts of consuming those fuels, such as greenhouse gas emissions, traffic accidents, congestion, and road damage. Freight charges of fuels to outer islands are also subsidised but this subsidy was not considered in this study. Neither did the study review subsidies on the consumption of electricity.

The estimated subsidy for kerosene over the period 2011–2015 was on average AUD 0.60 per litre, for benzene AUD 0.45 per litre, and for diesel AUD 0.20 per litre for both PUB and non-PUB consumption. On an annual basis, this means a total subsidy between AUD 3.8 million and AUD 9.0 million, or on average AUD 7.1 million for the three fuels. Considering the size of Kiribati, these are very significant figures. Between the years 2011 and 2014, the subsidies would have been equivalent to between 4 and 5 per cent of Kiribati's GDP. In 2011, the subsidies would have corresponded to 8.6 per cent of government revenues, which is high compared to other countries in the world. Between 2011 and 2014, the estimated subsidy was also equivalent to 42 per cent of Kiribati government education expenditure and 53 per cent of health care expenditure.

The objective of subsidies is widely considered to be making fuels affordable for the poor. Yet experience from elsewhere in the world shows that fossil fuel subsidies provide an inefficient policy to support the poor. For example, a subsidy on benzene consumption tends to benefit private car owners, who often also belong to wealthier households. The data, although limited, suggest that this may be the case in Kiribati too. Solid evidence to support the belief that subsidies on diesel and kerosene effectively help the poor was also not found. Compared to general subsidies on fuels, targeted transfers and other social policy instruments are generally considered more effective ways to support the poor (see for example Komives, Foster, Halpern, Wodon and Abdullah 2005; and Sdralevich, Sab, Zouhar, and Albertin 2014). In terms of environmental impact, it is estimated that eliminating the subsidies alone would cut Kiribati CO_2 emissions by almost seven per cent compared to 2008 levels. Eliminating the subsidies alone would thus make a significant contribution to Kiribati's Intended Nationally Determined Contribution (INDC) target of 13.7 per cent reduction in greenhouse gas emissions by 2025. In addition, subsiding kerosene has adverse health effects on the people in the form of indoor air pollution.

In summary, the subsidies mean a substantial loss of government funds, increase financial flows out of Kiribati, make the country more dependent on fossil fuels and hence vulnerable to the volatility of world market prices, significantly increase greenhouse gas emissions, and are likely to aggravate the detrimental health effects of kerosene. They also distort the economy, leading to economic inefficiency. Yet the evidence, although based on limited data, suggests that subsidies are poorly targeted to support poorer households. Instead of subsidising fossil fuels, these resources could be spent in better ways. For example, the amount that is currently spent on subsidising fossil fuels could be used to considerably boost education and health care spending. Kiribati has already in place some policies to promote sustainable use of energy and energy efficiency, such as the Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management (KJIP), which risks being counteracted by the government's subsidy policies on fuels.

It is recommended that the Government of Kiribati eliminate these subsidies. The current situation of low international oil prices is a good moment to reform fossil fuel subsidies, since it requires smaller increases in prices to meet the real cost of consuming the fuels. It is recommended also that Kiribati replace price controls of fuels with an automatic pricing control mechanism covering benzene, diesel, kerosene and Oil 50. This could be accompanied by techniques, such as price bands, to protect consumers and businesses against volatility in prices. The government is also urged to apply 12.5 VAT and excise duty on all fuels. Excise duty should be adjusted to reflect the true cost of the negative effects of consuming the fuels. It is acknowledged that such reforms may encounter resistance and be challenging to implement in practice. Thus, they should be gradually implemented and accompanied by a communication strategy to inform the public of the true cost and impact of subsidies and the reasons for reform. The government could also increase the transparency of the subsidies by fully accounting for them in government accounts.

While generally a beneficial thing to do, eliminating the subsidies could have undesired negative effects on some households and businesses, and these would need to be taken into account when planning the reform. In particular, the effect on the fishing industry would need to be better understood, as well as the effect on public transport fares and cooking costs in some lower-income households. However, it is believed that it is possible to compensate the potential losers of the reform with better targeted and more effective policies instead of general subsidies on fuels. Examples of such potential policies include cash transfers to low-income households, abolishing education or other fees, and tax reductions for those facing the most negative effects. These policies are likely to come at a much smaller cost compared to the current subsidies.

1. Introduction

Ever since the adoption of the Kyoto Protocol in 1997 there has been a drive in the world to move away from fossil fuels that are the main cause of global climate change. Most recently, at the United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP21) in Paris in December 2015, the world showed a concerted will to address the issue of climate change and move away from fossil fuels.

Although the world's nations have agreed to work to reduce greenhouse gas emissions, a report published by the Overseas Development Institute (ODI) and Oil Change International in 2015 concluded that G20 countries alone spend USD 452 billion on subsidising the production of fossil fuels (Bast, Doukas, Pickard, van der Burg, & Shelagh, 2015). The International Monetary Fund (IMF) found even higher figures when looking at the consumption side. They asked the question: 'How large are global energy subsidies?', and found out that post-tax energy subsidies, which also include the negative external costs of subsidies to fossil fuels, including on health and environment, were USD 4.9 trillion in 2013 and projected to increase to USD 5.3 trillion in 2015 (Coady, Parry, Sears, & Shang, 2015). According to the IMF authors, this is equivalent to 6.5 per cent of global gross domestic product, and eliminating these subsidies would cut global CO_2 emissions by more than 20 per cent. In addition, premature deaths related to air pollution in the world could be cut by more than half.

Pacific Island countries and territories (PICTs) are often mentioned among the countries suffering most from climate change. Yet at the same time they are heavily dependent on fossil fuels. For many PICTs, fossil fuels are almost the only source of electricity (PPA, 2015). One of the outcomes of the Second Pacific Regional Energy and Transport Ministers' Meeting in Denarau, Fiji in 2014 was to encourage countries to review energy subsidy policies and to make adjustments to encourage the uptake of cleaner energy options. Recently, through their intended nationally determined contributions (INDCs) submitted to the UNFCCC in preparation for COP21, PICTs also expressed an increased willingness to expand the share of renewable sources in their energy mix and to improve on their energy efficiency.

While PICTs are committed to a renewable energy based and energy efficient future expressed in practical and voluntary targets contained in their INDCs, subsidies on fossil fuel is a potential major barrier to this effort from two perspectives:

- fossil fuel subsidies promote continued reliance on fossil fuels by keeping fuel prices lower than their real prices; and
- fossil fuel subsidies divert scarce national resources away from being invested in renewable energy and energy efficiency programmes on the ground.

This report looks at fossil fuel subsidies in the Republic of Kiribati. Kiribati is an island nation in the Pacific Ocean located around the equator. The country is divided into three groups of islands: the Gilbert Islands, the Phoenix Islands, and the Line Islands. These are spread over a vast area of sea with an exclusive economic zone of 3.6 million km^2 (SPC, 2012) and inhabited by approximately 110,000 inhabitants (National Statistics Office, 2016a). Kiribati is classified by the World Bank as a lower middle income country (World Bank, 2016), with a head count index of 22 per cent of the population living below the basic needs poverty line (KNSO; UNDP, 2010).

In Kiribati, the government applies price controls and tax breaks for fossil fuels. The objective of these measures is widely believed to be to keep fuel prices affordable and not too costly for the poor. One of the least developed PICTs and a country highly vulnerable to climate change, Kiribati is also highly dependent on fossil fuels. Nevertheless, Kiribati was also among the first PICTs to embrace renewable energy. It established the Kiribati Solar Energy Company (KSEC) in the early 1980s.

First, the report provides an overview of energy supply and use in Kiribati. Second the report discusses policies related to pricing and taxation of fuels. After this it attempts to estimate fossil fuel subsidies in Kiribati by, for example, quantifying the amount of subsidies both pre-tax and post-tax, according to a methodology applied by IMF. The report then tries to identify the effect of these subsidies and who benefits from them. Finally, this report comes up with recommendations for reform.

2. Overview of the energy sector

2.1 Energy supply

The two main sources of primary energy in Kiribati are biomass and automotive diesel oil (ADO). Together these two cover more than two thirds of total energy consumption (see Figure 1). Biomass consumed for energy consists of coconut shells, husks, and fuel wood (MFED, 2014), and together with solar power are the only sources of energy produced locally. Copra drying and cooking using biomass are still the biggest renewable energy uses (Ministry of Public Works and Utilities, 2009). Apart from biomass and solar power, the rest, approximately 64 per cent of total primary energy supply, is imported. Imported fuels include ADO, motor benzene (mogas), kerosene, and small amounts of liquefied petroleum gas (LPG), aviation benzene (avgas), and lubricants. These are imported and distributed by a government-owned company, Kiribati Oil Company (KOIL). The main supplier of solar power is Kiribati Solar Energy Company (KSEC). Copra is produced by Kiribati Copra Cooperative Society (KCCS) and coconut oil by Kiribati Copra Mill Company Limited (KCMCL).

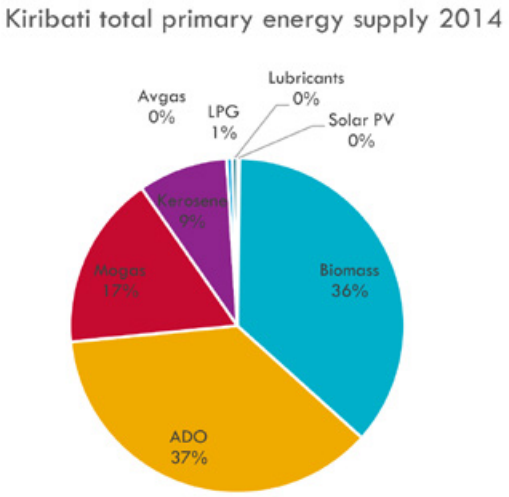

Figure 1. Total primary energy supply by type of energy in Kiribati in 2014 (Source: SPC and government of Kiribati data)

Although the use of solar power has been increasing rapidly, it is still fairly insignificant in the total energy supply. Figures 2 and 3 show the energy supply by type since 2000 in absolute and relative terms. By far the biggest growth has been seen in solar power supply, which, between 2000 and 2014, grew almost sevenfold. Yet the total amount of solar power supplied is still less than one per cent of the overall energy supply. The statistics also show quick growth for LPG at the beginning of the period but its supply has been declining steadily since. The data suggest that residential users previously using LPG may have replaced it with kerosene as a cooking fuel. The supply of kerosene has almost doubled over the same period. A previous study by SPC demonstrates that kerosene current tax and pricing policies may favour kerosene over LPG (SPC, 2015). The supply of mogas has also grown in a similar manner.

The two biggest sources of energy, biomass and ADO, have remained fairly stable, with a slight increase in ADO. Although the total energy supply in Figure 2 shows a weak increasing trend, the net supply of energy[1] has remained more or less the same in the 21st century. One reason for this is increased electricity production.

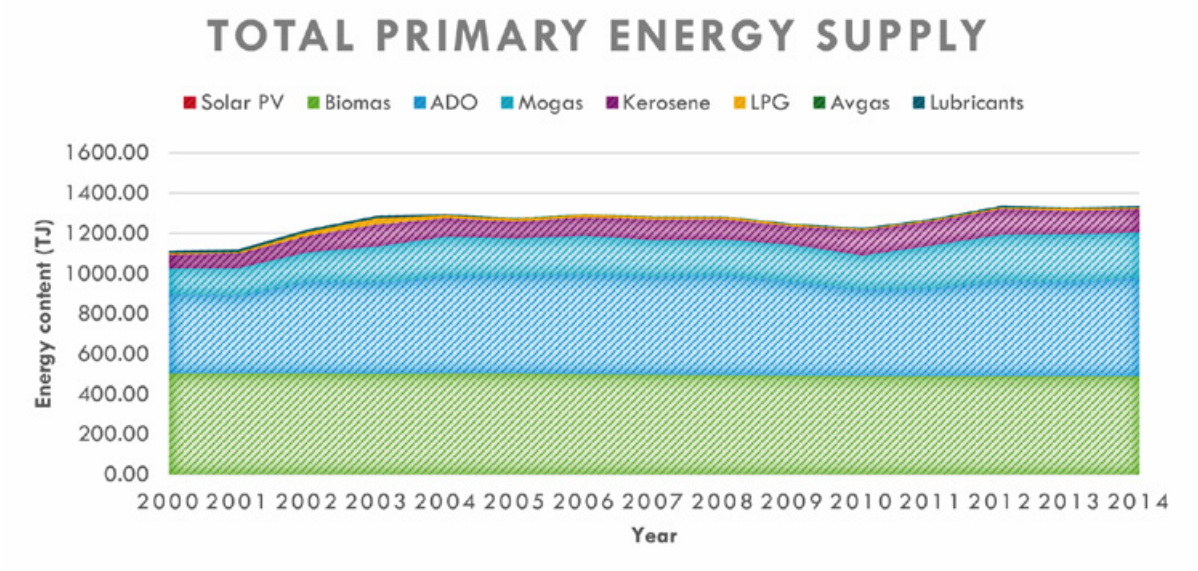

Figure 2. Total primary energy supply in Kiribati (Source: SPC and Government of Kiribati data)

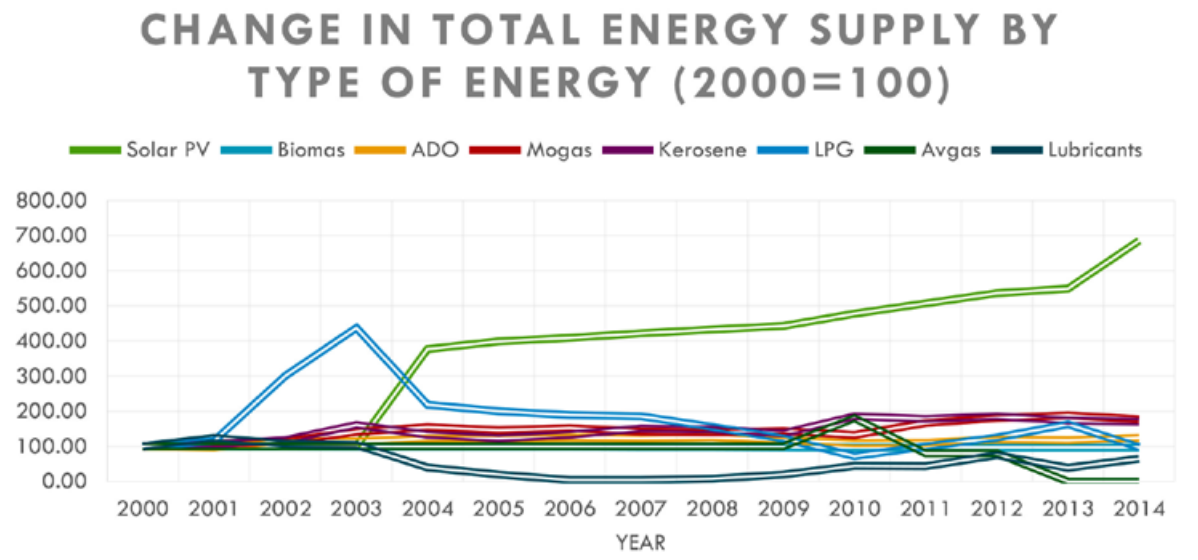

Figure 3. Change in total energy supply by type of energy (2000=100) (Source: SPC and Government of Kiribati data)

1 Net or final energy supply takes into account conversion of energy into other forms such as electricity generation and the energy used or lost during the conversion.

2.2 Electricity supply

Electricity production in Kiribati has increased much more quickly than energy supply in general (see Figure 4). During the period 2000–2014 electricity production increased at a compound annual growth rate of 3.9 per cent while during the same period the primary energy supply barely increased. The main producer of electricity is the Public Utilities Board (PUB). With the exception of solar power and some private generators, PUB is granted an exclusive licence to produce electricity in Gilbert Islands by the Public Utilities Ordinance (Cap 83) of 1997 and its several amendments. The Public Utilities Board produces electricity from imported automotive diesel oil and from some recently added solar power capacity. In Kiritimati and other islands outside of Tarawa, electricity is mostly provided by small scale solar systems (IRENA, 2012).

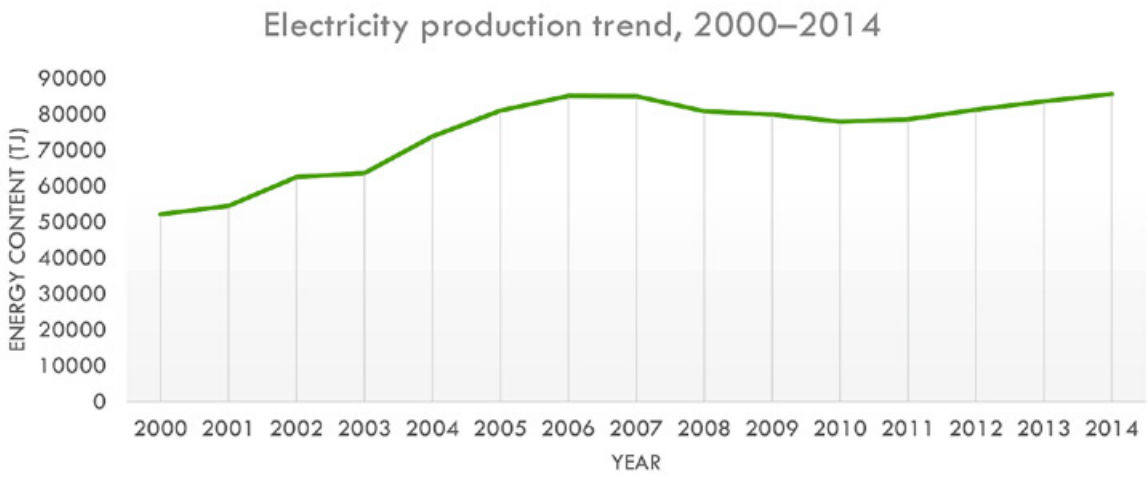

Figure 4. Electricity production trend, 2000–2014 (Source: SPC and Government of Kiribati data)

The Sustainable Energy for All Global Tracking Framework (SE4All, 2015), estimated that in 2012, 59 per cent of the population of Kiribati had access to electricity – a steady growth since 1990 when the access rate was 49 per cent. This rate is well above 29 per cent, the average in the Pacific, and comparable to countries and territories such as Fiji (59), Palau (59), New Caledonia (59) and Federated States of Micronesia (59 per cent). However, it is well below the global access rate which was 85 per cent as estimated by SE4All.

2.3 Energy trade

Kiribati remains highly dependent on petroleum imports for urban electricity generation and for land, sea, and air transport (Ministry of Public Works and Utilities, 2009). All fossil fuels are imported into Kiribati. When measured by volume, diesel, which is used for electricity production, makes up more than half of total fuel imports to Gilbert Islands, while benzene and kerosene make up the most of the remainder of imports (see Figure 5). In 2014, a total of about 22 million litres of fuel were imported to Gilbert Islands and about 3 million litres to the Phoenix and Line Islands. During the period 2000 to 2014, the volume of benzene and kerosene imports grew at a faster rate than diesel imports. The compound growth rate for all fuels was about 2.4 per cent per year. According to the Ministry of Public Works and Utilities (2009) the reason for growth in petroleum imports has been mostly population and economic growth in Tarawa. Most of the growth occurred from 2000 to 2003 and since 2003 the total volume of fuel imported to Gilbert Islands has remained more or less the same at around 20–21 million litres (SPC, 2013). The total value of fuel imports grew more quickly than the GDP of Kiribati (see SPC, 2013). However, this was due to the increase in world petroleum prices and not due to increased consumption. It appears that world petroleum prices have had little impact on the amount consumed in Kiribati.

A challenge regarding fuel imports has been the limited storage capacity of KOIL. Tankers currently supply fuel to Kiribati on average every 28 days (Government of Kiribati, 2014a). The current storage capacity is also just one month, which has caused problems in the past (Matakiviti, 2008). If the tanker's arrival is delayed for whatever reason this can cause fuel shortages in the country. As a response, KOIL is currently expanding their storage capacity. It is hoped that this expansion will also provide economies of scale benefits and promote more competitive fuel pricing from suppliers (Government of Kiribati, 2014a).

A large share of kerosene is re-exported, as it is sold to the aviation industry. This share has varied over the years and, according to data from KOIL, was on average 48 per cent between 2010 and 2014. The remainder has been mostly for domestic households.

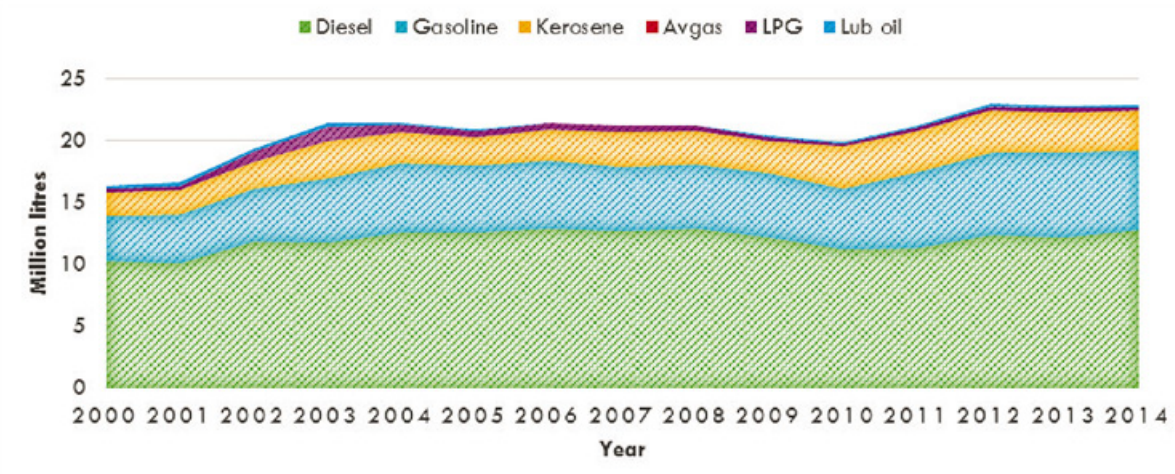

Figure 5. Gilbert Islands fuel imports by volume (Source: SPC and Government of Kiribati data)

2.4 Potential for renewable energy to replace fossil fuels

There is a good potential for solar energy in Kiribati. IRENA (2012) estimated solar resources at 5.5-6.0 kWh/m^2/day and a study on Kiritimati confirmed high average levels of horizontal solar radiation at 6.3 kWh/m^2/day but warned that levels are affected by El Niño seasonal oscillation (ITP, 2014). In the outer islands of Kiribati, biofuel in the form of coconut oil is considered to be a promising energy source and certain areas of the country like Kiritimati have good potential for wind power. IRENA reported that the potential for coconut oil production is very good and wind energy is usable too. These results indicate that there is scope for increasing the share of renewables from Kiribati's current modest levels in the energy mix.

On energy efficiency, a 2011 study conducted by the Australian Department of Climate Change and Energy Efficiency and the Australian Agency for International Development (AusAID) for SPC on the Costs and Benefits of Introducing Standards and Labels for Electrical Appliances in 14 Pacific Island Countries revealed that, for residential, commercial and government sectors combined, energy efficiency measures would mean that projected electricity use in 2025 would be about 2672 GWh instead of 3031 GWh, a saving of about 12 per cent, or 359 GWh per year (George Wilkenfield and Associates PTY Ltd. , 2011). The study found that the benefits of introducing the standards in Kiribati would have a net present value of USD 6.8 million from 2010 to 2025 using an oil price of USD 75 per barrel. However, oil prices have dropped since and are closer to USD 40 or 50 per barrel.

2.5 Energy consumption

Most of the energy consumed in Kiribati is destined for residential or transport use (see Figure 6). Industry, commercial, and government uses account for only 6 per cent of total energy consumption. In terms of efficiency in the use of energy, the gross domestic product (GDP) per unit of energy used has declined significantly since 1994, but has been more stable over the past decade (MFED, 2015). In 2007 the ratio of GDP per unit of energy used was 15.1, higher than 7.2[2], the figure for the whole world (World Bank, 2016). Per capita energy consumption in the outer islands is very low, consisting mostly of solar power and biomass for lighting and cooking (Government of Kiribati, 2014a).

The most widely used energy source for transport is ADO. As Figure 7 shows, just over half the total final energy consumption for transport is ADO for land transport and about 13 per cent ADO for water transport. Land transport also uses about 30 per cent of total energy consumed for transport in the form of mogas. These three uses form almost all of the energy consumed for transport.

By far the biggest source for residential energy is biomass (e.g. coconut shells) used for heating and cooking. According to an SPC estimate, biomass accounts for about 88 per cent of residential energy use, and is more common in the outer islands. Electricity accounts only for about six per cent of residential energy consumption and is used mainly in South Tarawa. As mentioned earlier, electricity in Kiribati is produced mostly from diesel by the Public Utilities Board. Mogas is consumed by a similar amount (6 per cent), whereas kerosene is less than one per cent of the total. According data from PUB, electricity is more commonly used by industry, government, and commercial uses than by residential users. In fact, together, these account for about half of electricity use. Consumption of electricity has been growing more quickly compared to energy consumption in general. However, as with energy supply, most of the growth occurred prior to 2006, after which electricity consumption has remained fairly stable. In 2014 total electricity consumption was over 67 terajoules.

2 Measured as constant 2011 purchasing power parity USD per kg of oil equivalent

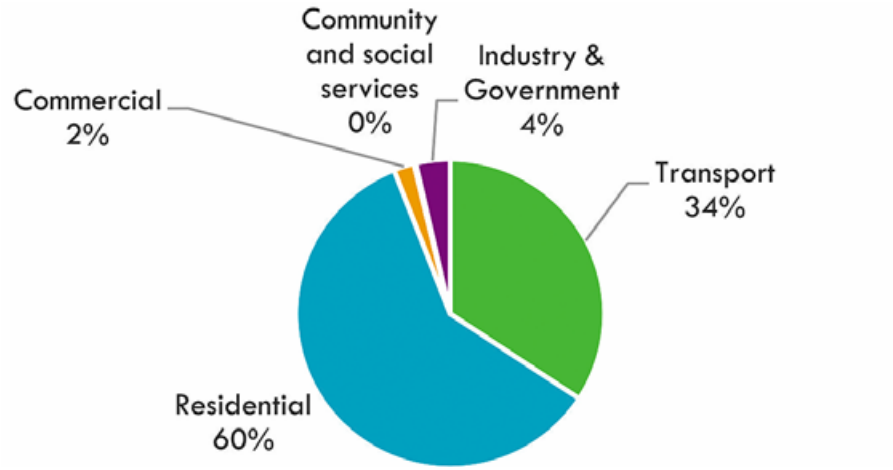

Figure 6. Final energy consumption by use in Kiribati in 2014 (Source: SPC and Government of Kiribati data)

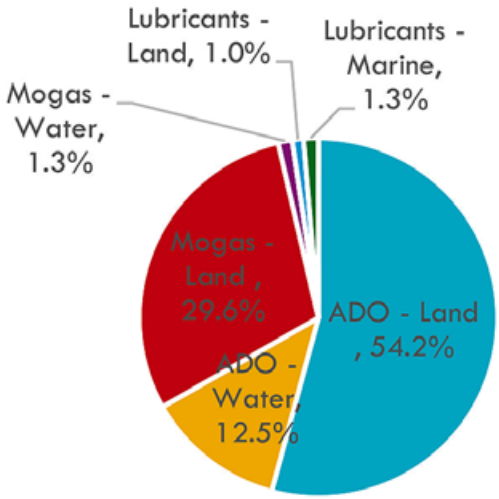

Figure 7. Transport final energy consumption by source in Kiribati 2014 (Source: SPC and Government of Kiribati data)

3. Energy prices

3.1 Fuel prices

The Price Ordinance (Cap 75) from 1981 allows the Minister of Commerce, Industry and Cooperatives to regulate the price of fuel products. Figure 8 shows the historical retail prices of benzene, kerosene and diesel in the Gilbert Islands. Currently, benzene and kerosene prices are regulated within the price ordinance, but it appears from Figure 8 that, in practice, the diesel price is also controlled. The ordinance also regulates that kerosene and benzene retail prices should be the same in all locations within the Gilbert Islands. As can be seen, the prices of all three fuels were regularly adjusted until 2009, after which they have remained stable with only little adjustment to the price of diesel.

Another thing to note is that, prior to 2009, the retail prices of all three fuels were fairly close to each other, but since 2009 there has been a significant difference in prices. This was not the case with international prices (see Figure 9), suggesting that at least benzene and kerosene prices have been subsidised since 2009. Kerosene is sold at the lowest price, and is now exempt from both excise duty and 12.5 per cent value added tax (VAT). Benzene and diesel are exempt from VAT but not from excise duty (apart from diesel used for electricity generation).

Although local retail prices are controlled, they still tend to follow trends in world prices (see Figure 9), even after being almost constant since 2009. This is because there is a high correlation between the AUD/USD exchange rate and world oil prices.3 Thus, even if the price is fixed in AUD it will tend to some extent to follow trends in international oil prices, if other factors remain constant. Figure 9 also shows that fuel retails prices, with the exemption of kerosene, are well above Singapore FOB prices. This suggests high freight and distribution costs for ADO and gasoline sold in Gilbert Islands and a possible heavy subsidy on kerosene.

3 Correlation coefficient in the data used was 0.93 between monthly averages of Platts ULP 92 RON and AUD/USD exchange rate from January 2000 to December 2015.

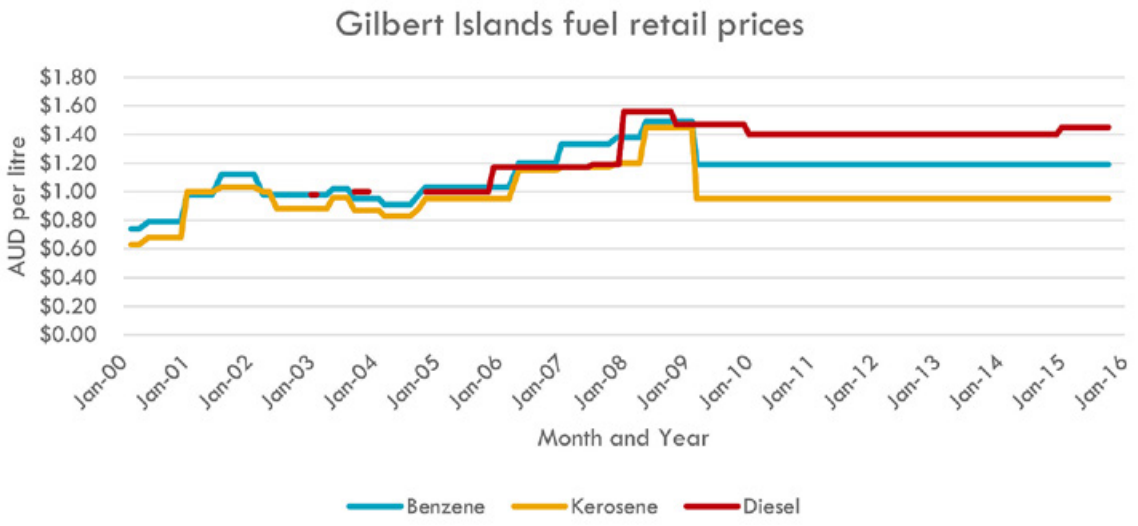

Figure 8. Retail prices of main fuels in Gilbert Islands, Kiribati (Source: SPC and Government of Kiribati data)

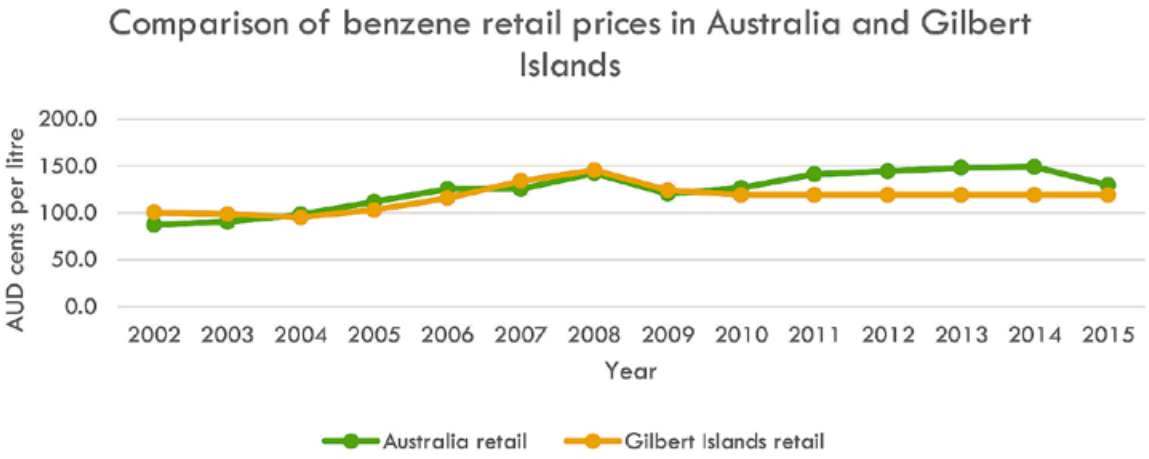

Figure 9. Retail prices of benzene, diesel and kerosene in Gilbert Islands, Kiribati compared with Platts Singapore FOB prices (Source: SPC and S&P Global Platts data)

Further comparison with benzene retail prices in Australia (see Figure 10) shows that since 2011 the gap between the Gilbert Islands and Australian benzene prices became much wider. Prices in the Gilbert Islands were less volatile and lower, due to price controls. The comparison needs to take into account the tax structure which in Australia is different at present, consisting of an excise duty of AUD 0.38 per litre and a 10 per cent goods and services tax. When adjusted for the tax structure, one would assume that prices in Kiribati would be different compared to Australia due to higher freight costs, Australian prices being less regulated and more competition in the retail sector. This is true for 2015 with a pre-tax retail price in Gilbert Islands of AUD 1.12 and in Australia of AUD 0.80 per litre.

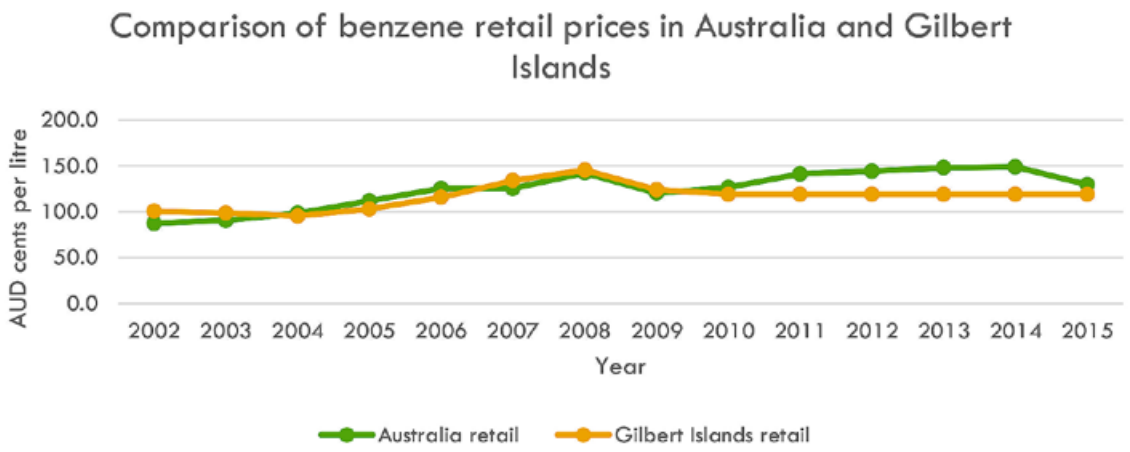

Figure 10. Average annual benzene retail prices compared in Australia and Gilbert Islands, Kiribati. (Source: SPC, Government of Kiribati and Australian Institute of Petroleum, (2016))

3.2 Electricity tariffs

Electricity is provided to South Tarawa by the government-owned Public Utilities Board (PUB), which has different tariffs for domestic, industrial, commercial and government office users (see Figure 11). The tariff for domestic users has been lower than tariffs for other users. The current domestic tariff, AUD 0.40 per kWh, is about 73 per cent of the tariff paid by commercial and government users. Since 2008 the tariff for industrial users has been set considerably higher than for commercial users. The current industrial tariff of AUD 0.70 per kWh is about 27 per cent higher than the commercial tariff of AUD 0.55 per kWh and almost twice the domestic tariff. According to the ITP (2014) the electricity tariffs are lower in Kiritimati at AUD 0.30 per kWh and AUD 0.33 per kWh for domestic customers and commercial customers respectively.

The Pacific Power Association compared electricity tariffs across the Pacific in their benchmarking report (PPA, 2015). According to the report, in 2012, a domestic customer of PUB paid about the same as the Pacific average for 50 kWh monthly consumption, which is USD 21.10 in total. However, for commercial users using 1000 kWh per month the cost for PUB customers was higher, at USD 0.55 per kWh, than the Pacific average of USD 0.49 per kWh. In general, fuel and electricity prices in the Pacific are relatively high by international standards (Davies & Sugden, 2010). Possible reasons for that include remote locations, low volumes, and limited competition. In Kiribati, over 65 per cent of PUB's operating costs are spent on diesel purchases from KOIL (Tonkin & Taree, 2016). This is around the same as the median of Pacific Power Utilities (PPA, 2015).

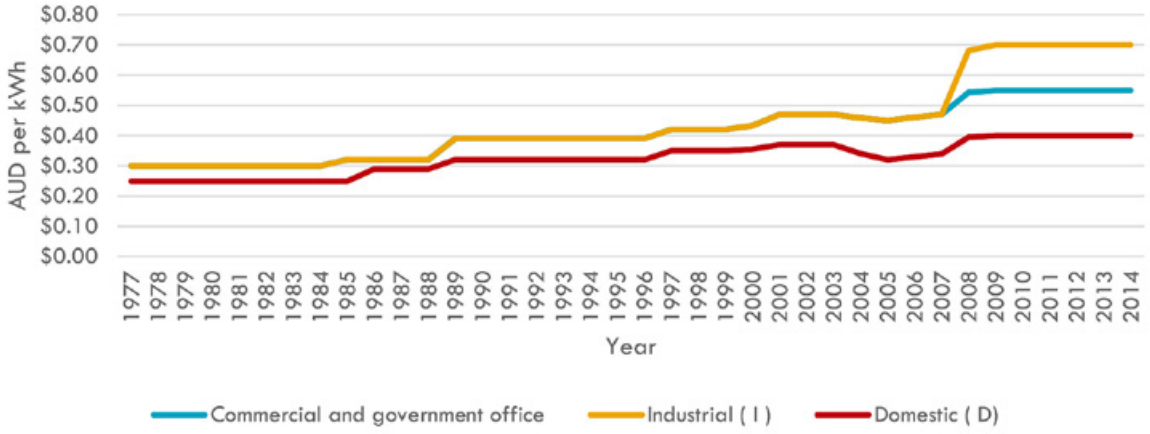

Figure 11. South Tarawa electricity tariff (Source: SPC and PUB)

4. Fuel pricing and taxation policies

4.1 Definition of a subsidy

The World Trade Organization (WTO) has a legal definition for subsidies in the Agreement on Subsidies and Countervailing Measures, which has been approved by more than 150 WTO members (see Table 1). This definition is recommended by the Global Subsidies Initiative (GSI) for definition, measurement and evaluation of subsidies (GSI, 2010). According to GSI, subsidies can take many forms, such as direct payments linked to volume of sales, prices set below market rates for consumers with or without financial contribution from the government, loans below market rates provided by the government, assumption of occupational health and accident liabilities, reduced tax rates, and accelerated depreciation allowances. In Kiribati, the most visible forms of subsidies on fuels are price controls and preferential tax treatments. These are discussed here.

Table 1. Definition of a subsidy according to the ASCM (Uruguay Round Agreements, 1994)

Definition of a subsidy

1.1

For the purpose of this Agreement, a subsidy shall be deemed to exist if:

(a) (1) there is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as "government"), i.e. where:

(i) a government practice involves a direct transfer of funds (e.g. grants, loans, and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees);

(ii) government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits);

(iii) a government provides goods or services other than general infrastructure, or purchases goods;

(iv) a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments;

or

(a) (2) there is any form of income or price support in the sense of Article XVI of GATT 1994;

And

(b) a benefit is thereby conferred.

4.2 Price control

Prices of selected consumer goods are controlled in Kiribati under the Prices Ordinance (Cap. 75) and the Prices (Amendment) Act, 1981 with the goal of protecting consumers. There are currently 13 price controlled items, including benzene, kerosene, and oil No. 50 (MCIC, 2010). For goods such as rice, sugar, and tobacco, the set retail price is calculated for each shipment of imports based on the actual import and freight costs. The objective of this exercise is to make sure that goods are fairly priced and that suppliers are not able to make excess profit from them. This calculation is done by the Ministry of Commerce, Industry and Cooperatives. However, for fuels, the prices are set through an ad hoc political process by the cabinet, meaning that for fuels there is no clear mechanism, such as a formula or template, for setting the prices. Rather, fuel prices appear to be subject to political decision. The objective behind the price control of fuels seems less clear, but is generally thought to be guaranteeing affordability of fuels for the wellbeing of people. In practice, this appears to include the price of diesel as well. The prices of benzene and kerosene have seen no adjustments since 2009. Diesel, which officially is not part of the Prices

Ordinance, has been subject to only a very few changes during the same time period. Oil 50, which is used by fishing boats in a blend with benzene for outboard motors, is price controlled, while oil 30, which is used as a lubricant for engines, is not price controlled.

4.3 Duties on products

Duties are not only a major source of income for governments but they are also levied to support government's policies and goals by influencing consumer behaviour. Very often, one can understand the priorities of a government by studying the duties and taxes levied during a certain period.

An import levy is collected on all imports to Kiribati. It is charged at the rate of AUD 30 per m^3 of imports. The funds collected are meant to be used to subsidise the shipping of goods to outer islands (See CIE, 2013). When goods are shipped to outer islands, the shipper is eligible for reimbursement of the domestic freight fees from the Kiribati government.[4] Because of this, price-controlled items can be the same price on all islands.

Until 2014, the Kiribati government charged customs duties on most goods, in addition to the import levy. The duty varied according to the product, e.g. most fruit and vegetables were charged at 30 per cent, clothing at 60 per cent, ships and boats at 10 per cent, while pharmaceutical products, fertilisers, and works of art were exempt (Kiribati Customs). However, customs duties were abolished in the tax reform of 2014, which replaced them by value added tax (VAT) and excise duty. Now, most goods are not charged excise at all. The goods that are charged excise duty include swine meat, mackerel, sugar, alcohol, tobacco, and motor vehicles. Kerosene, oil 30 and 50 are all exempt but benzene has an excise duty of AUD 0.07 per litre and diesel fuel AUD 0.06 per litre. For new cars, the excise rate is 28 per cent for cylinder capacities under 3000 cm^2 and 38 per cent for capacities exceeding it, whereas for used cars the rates are 30 per cent and 40 per cent respectively or AUD 400, whichever is higher.

4.4 Value added tax

In Kiribati value added tax (VAT) is now applied to all traded goods and services using a flat rate of 12.5 per cent. As mentioned it was introduced in April 2014 when it, together with excise duty, replaced import duty. However, there are some exemptions such as financial services and international and local freight. Financial services are also commonly exempt of VAT elsewhere in the world. When it comes to fuels, benzene, kerosene, diesel fuel, and oil 50 are also VAT free, forming another type of subsidy for these fuels.

4.5 Tax burden on fuels and electricity

Before the introduction of VAT, the tax burden on fuels was light compared to other consumer goods. Essential items to human wellbeing, such as clothing, vegetables and fruit, were taxed at much higher rates. For example, t-shirts had a customs duty of 60 per cent and lettuce 30 per cent, while at the same time kerosene was duty free and more luxurious swine meat was taxed at only 20 per cent. The 2014 tax reform was a big improvement, harmonising the taxation of most goods by applying the 12.5 per cent VAT and removing customs duties with a zero excise rate. This should reduce the distortionary market impact of taxation and improve economic efficiency. Previously, customs duties were in general lower for intermediate goods than for consumer goods, while the new excise has been applied only to goods that are associated with negative externalities, such as alcohol and sugar, but not on some fuels. These corrective taxes are also a step in the right direction for a less distortionary tax regime.

4 The reimbursement is 100 per cent of the freight rate from South Tarawa to other locations in Gilbert Islands and 83 per cent for freight to Line and Phoenix Islands (CIE, 2012).

Nevertheless, the total tax burden on fuels is still less than on most other goods, with no VAT or excise applied to kerosene at all. Benzene and diesel have been charged corrective excise rates but this has been nullified by the removal of VAT on these fuels. Now, the overall tax burden for both is even below the VAT rate. There appears to be a subsidy in the form of preferential tax treatment for all three fuels. Figure 12 shows a comparison between the three most common fuels and three other selected items in terms of total tax burden on the import price. The comparison ignores import levy, which is applied based on the volume of the item. The import levy makes it comparatively cheaper to import items low in volume.

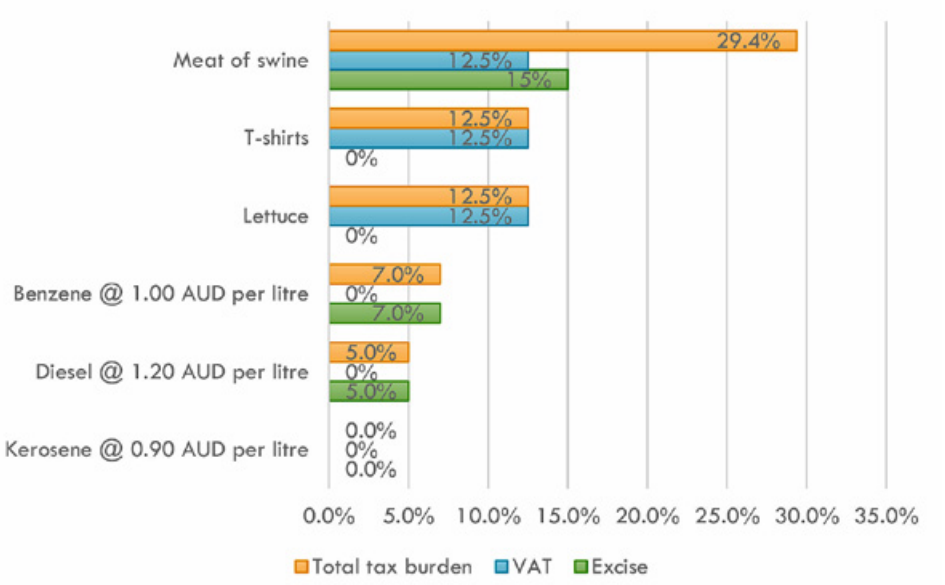

Figure 12. The total tax burden in Kiribati on selected imported goods, including excise duty and VAT but excluding import levy.[5] (Source: Author's calculation)

Electricity sold by PUB is exempt from VAT. In addition, diesel purchased by PUB to produce electricity is exempt from the normal charge of AUD 0.06 per litre. PUB stated that in April 2014 VAT was applied to electricity at the time of the national introduction of VAT on goods and services. However, in August 2015, a decision was made to exempt electricity from VAT and to refund the VAT charged to customers.

Table 2. Summary of price control and tax policies in Kiribati on selected items

	Price control item	VAT rate	Excise rate
Benzene (gasoline unleaded)	Yes	Free	AUD 0.07 per litre
Kerosene, household	Yes	Free	Free
Diesel fuel	No	Free	AUD 0.06 per litre
Oil 30	No	12.5%	Free
Oil 50	Yes	Free	Free
Petroleum gases	No	12.5%	Free
Electricity (PUB)	No	Free	Diesel used to produce electricity by PUB is exempt

5 The import levy is applied on commercial goods at 30 AUD per cubic meter or per 875 kilograms (CIE, 2012).

4.6 Other subsidy policies

Electricity tariffs are set lowest for households and highest for industrial users. This suggests cross-subsidisation of household consumers by industrial users. Electricity is an intermediate good for locally produced manufactured goods. If the price of electricity is very high, this can increase the price of locally produced goods in relation to imported ones for domestic consumers or decrease their competitiveness for export.

Some state-owned enterprises also receive grants from the government. In 2012 and 2013 the Kiribati government gave KOIL a total of about AUD 3.3 million to cover bad debts. This can be considered a subsidy on production that is not captured by the price-gap estimates (See 5.2), which quantify subsidies on consumption only.[6]

5. Quantification of subsidies

5.1 Pass through

The extent to which global oil prices are reflected in the domestic retail prices of fuels is measured by pass-through coefficients.[7] A pass-through coefficient of less than one suggests the presence of subsidies. The coefficient calculated for the three types of fuels in Table 1 show a high degree of variance. This suggests a pricing mechanism that is ad hoc and not directly linked to world oil prices, unless there is a significant time lag in its implementation. It also suggests that diesel prices are controlled too. For some years, the coefficient is high for all fuels, e.g. from two to over four in 2007. This means the magnitude of change in domestic retail prices was up to more than four times the change in international prices. At the same time some years have a negative coefficient, meaning that retail prices moved in the opposite direction to world prices. The average values over the period suggest that retail prices in Kiribati have changed more than world retail prices. This should be the case when *ad valorem*[8] type taxes, such as VAT, are present. However, these three fuels are exempt from VAT and other *ad valorem* taxes. For the period 2010 to 2014, the kerosene retail price changed less than the world price due to price controls, which kept the retail price constant during that period. When pass-through is measured in AUD, between 2011 and 2014 it was zero, since local prices did not change. The pass-through method on its own does not necessarily give information about the magnitude of any subsidies.

6 Nevertheless, if KOIL had price setting power and would not receive such grants for bad debts, part of these bad debts would be recovered by higher prices to consumers.

7 Pass-through coefficient (T) is measured $T = \frac{Pr_{(t)} - Pr_{(t-1)}}{Pw_{(t)} - Pw_{(t-1)}}$ as , where $Pr_{(t)}$ is the local retail price at time t, and $Pw_{(t)}$ the world price, and time t.

8 *Ad valorem* taxes are taxes that depend on the value of the object they are imposed on.

Table 3. Pass-through coefficient for Kiribati retail prices based on mean annual prices and world prices based on Platts Singapore FOB price (Source: author's calculation using Government of Kiribati and S&P Global Platts data)

	Pass through (in USD)		
	Gasoline retail	**Diesel retail**	**Kerosene retail**
2001	–2.80		–3.76
2002	1.16		5.30
2003	2.29		2.66
2004	0.72	1.28	0.54
2005	0.87	–0.06	0.63
2006	1.33	1.54	1.37
2007	4.21	2.17	3.93
2008	0.88	1.46	0.78
2009	1.21	0.44	1.07
2010	0.98	0.91	0.49
2011	0.73	0.75	0.51
2012	–0.09	–0.16	–0.18
2013	3.67	3.71	3.12
2014	1.43	1.27	0.88
Average	1.19	1.21	1.24
Average 2010–2014	1.34	1.30	0.96

5.2 Price-gap method

The price-gap method is used widely by the IMF and other international agencies (IMF, 2013). It attempts to quantify the value of consumer subsidies by calculating a cost-recovery price for a good where, for example, transport and distribution costs and a typical return to capital are added to the world price of the good. This cost-recovery price is then compared to actual prices, and the gap between the two is determined as subsidy (assuming the cost-recovery price is greater than or equal to the actual price). The price-gap method can be used to calculate both pre-tax subsidies, i.e. using tax-free prices, and post-tax subsidies, where corrective and other taxes that internalise the negative wider societal impacts of these subsidies are taken into account. When estimating corrective taxes, IMF takes into account climate change, road damage, congestion and accidents caused by the consumption of fossil fuels for transport.

Koplow (2009) provides an overview of the methodology and also discusses the advantages and disadvantages of the price-gap method. The main benefit is that it is a relatively simple method and does not require huge amounts of data to be analysed. This makes it particularly suitable for the Pacific region, where there is limited availability of data and information. It may also be possible to use the methodology when governments are unwilling to cooperate and share data with the analysts. The results of the method also make it possible to analyse the impact of subsidies and subsidy reforms on energy markets (demand and supply), trade flows and consumer welfare. The relative simplicity and low data requirements also make it easier to use the price-gap method for recurring analysis.

As disadvantages, Koplow (2009) mentions issues that affect the accuracy of the results. The accurate estimation of the cost-recovery price can be difficult, due to estimations of data inputs needed in the calculation. For example, transport costs may need to be estimated using benchmark values. Estimating domestic distribution costs to retailers and final consumers can also be a challenge, although this may in some cases be easier in island states than in countries with larger landmasses, where distribution is more dependent on land transport. While easier for petroleum products, estimating the cost-recovery price for goods that are not easily traded, such as electricity, becomes more difficult due to the lack of benchmark prices. Global prices themselves can also be subject to subsidies or other distortions. For example, the Organisation of the Petroleum Producing Countries (OPEC) was established to influence world oil prices. There may also be some subsidies that the method misses, because they do not directly affect energy prices. These can be, for example, subsidies on production of fossil fuels. The calculations are often based on average values and do not take into account fluctuations within time or variations within the target country or region. Finally, subsidised prices may distort investment decisions. For example, in a country with subsidies on petroleum products but no subsidies on renewable energy, investment decisions may be biased towards petroleum products, thereby slowing down the transition to renewable energy. This is not captured by the price-gap method.

In this study, the price-gap was first estimated for the three most commonly used fuels – benzene, diesel, and kerosene – for 2011 to 2013, when most data were available. Figures for 2014 and 2015 were prepared using extrapolation to fill in data gaps. Thus subsidies were estimated for the period 2011 to 2015, giving results for years with higher oil prices (2011–2013) and lower oil prices (2014–2015). Because the method uses world prices as a basis to estimate the cost-recovery price, while at the same time domestic fuel prices have remained almost constant (in AUD terms), world oil prices significantly affect the level of government subsidies. All estimates were prepared using the current tax regime, taking into account VAT, even though VAT was not applied prior to April 2014. In the calculations, VAT and excise rates were applied to the period 2011–2015.[9] This is because the study is meant to assess current and not past subsidy policies. The estimates also exclude the government subsidy on freight costs to outer islands.[10] Detailed explanations of the calculations can be found in Appendix 1.

The estimated average subsidies over the period 2011–2015 in per litre terms are shown in Figure 13. Overall, kerosene has the highest and diesel the lowest pre-tax subsidy, which does not take into account preferential tax treatment. Kerosene[11] received an average subsidy of AUD 0.33 per litre on the wholesale price[12] and gasoline AUD 0.14 per litre. The pre-tax price set for diesel appeared to be higher than the cost-recovery price, resulting in a negative price-gap of AUD 0.10 per litre, suggesting no subsidies are present. However, the pre-tax figures need to be interpreted carefully since they cover only part of the subsidies and exclude preferential tax treatment. For policy-makers, a more useful figure is the post-tax subsidy. The post-tax subsidy, measured at the retail price was again the highest for kerosene at AUD 0.60 per litre, followed by benzene at AUD 0.45 per litre. Diesel had the lowest subsidy at AUD 0.20 per litre, and is the same when used by PUB for electricity consumption. In post-tax terms all three fuels are clearly subsidised.

9 Different tax policies could have had an impact on demand for these fuels. Thus volumes consumed may have been different in the past if current tax policies had been applied. While this would affect the results of the price-gap estimates to some degree, it is unlikely that it would affect the main findings of this report. This is because the three fuels themselves had only minor changes in taxation, and most impact would have come from consumption decisions by consumers as a response to changes in the tax policy on other goods and the consequent changes in relative prices.

10 The import levy fund and subsidy to domestic shipping costs was already studied comprehensively by CIE (2012) and was thus not considered in this study.

11 Only kerosene for household use was included in the analysis (i.e. aviation use has been excluded).

12 The wholesale price was used due to lack of accurate estimates of domestic retail margins. In the absence of data, the retail margin used for the post-tax cost-recovery price was the difference between the controlled retail and wholesale price and not based on actual costs.

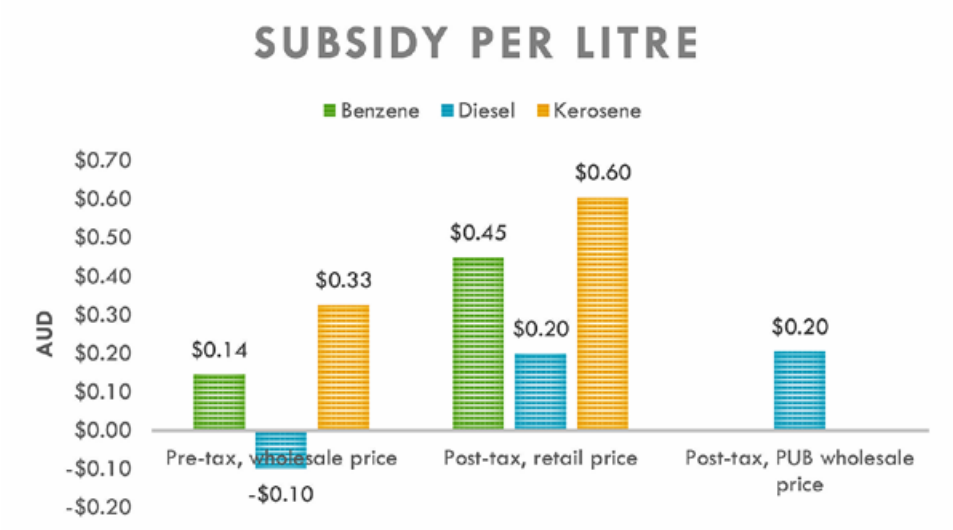

Figure 13. Average subsidy per litre (in AUD) during the years 2011–2015 estimated by the price-gap method (see Appendix 1 for details) (Source: author's estimates)

The total value of post-tax subsidies for the three fuels varied between AUD 3.8 million and AUD 9.0 million, with an average of AUD 7.1 million. This is a substantial value for a small nation like Kiribati. The estimates for each year are shown in Figure 14. Benzene and diesel make up most of the amount. Although kerosene had the highest subsidy in per litre terms, the total value of its subsidy is much less than the other two. This is because the overall volume of household kerosene consumed was much lower than the volume of benzene and diesel. On the other hand, diesel, which had the lowest per litre subsidy, has the most significant total value of the subsidy. The amount of subsidy on diesel consumption had a lot of variance over the 2011–2015 estimates, precisely because of the smallest subsidy per litre. Although other fuels such as oil 50 are also likely to have a significant per litre price-gap due to low volumes, the total value of subsidies on them is unlikely to be of higher magnitude than on kerosene.

Figure 14. Total value of annual post-tax subsidies on fuels, at retail price (AUD) estimated by price-gap method (see Appendix 1 for details) (Source: author's estimates)

While estimated post-tax subsidies were high, the total pre-tax subsidies were on average only AUD 342,000. This means most of the total subsidy is in the form of preferential tax treatment, although benzene and kerosene on their own still have considerable pre-tax subsidies as well. Figure 16 shows in detail what the post-tax subsidies consist of. The amounts are the averages of the 2011–2015 estimates. The VAT exemption is worth approximately AUD 4.0 million with AUD 2.4 million going to diesel alone. Exemption from excise duty and excise being too low as a corrective tax are estimated to be worth about AUD 2.5 million. However, the subsidy on the supply of the fuels, of which KOIL is likely to be the main recipient, is negative on diesel. This is in line with the pre-tax price of diesel being higher than that of other fuels, and explains why the estimated total pre-tax subsidy for the three fuels is not so high. [13]

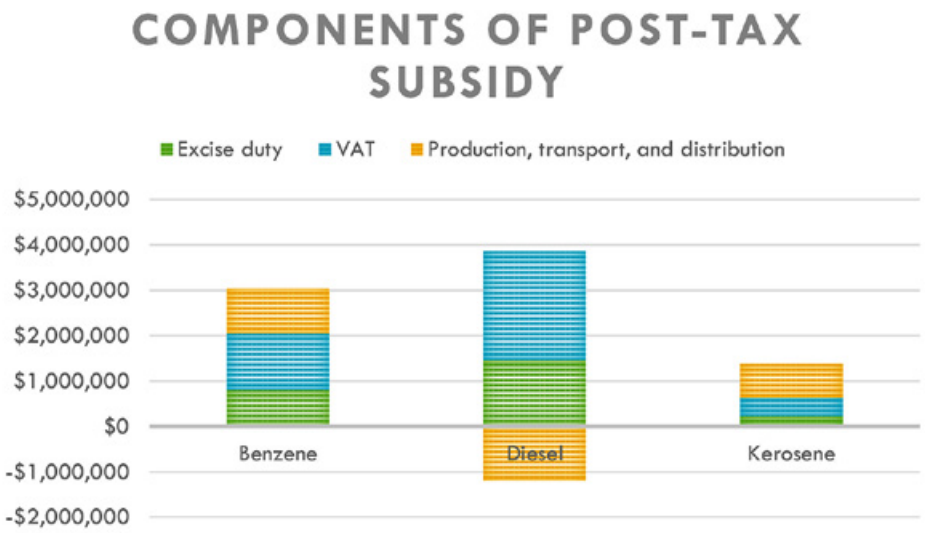

Figure 15. Components of the post-tax subsidy at retail prices, 2011–2015 average (Source: author's estimates)

6. Impact of subsidies

6.1 General macro-economic impact

Between 1996 and 2006, Kiribati made great achievements in alleviating poverty and meeting the Millennium Development Goal of halving the proportion of the population below the basic needs poverty line. The proportion dropped from 50 per cent in 1996 to 22 per cent in 2006 (MFED, 2015). However, economic development has been stagnant since then. The gross domestic product per capita has not grown since 2003, partly due to population growth. Per capita incomes remain amongst the lowest in the Pacific (MFED, 2014).

13 When estimated using the cost of sales data, instead of being negative, the subsidy on supply was in fact close to zero over 2011–2013, suggesting that the diesel pre-tax price was close to the actual cost of supplying it to the Kiribati market. See Appendix 1 for an explanation of the cost of sales approach.

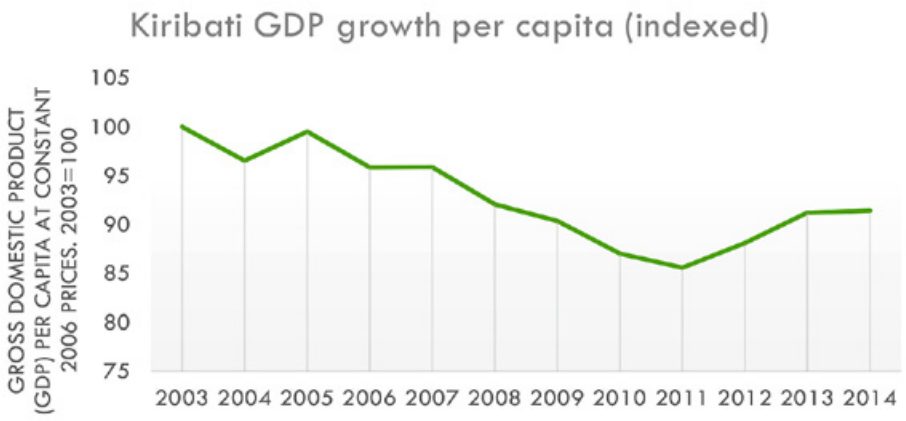

Figure 16. Kiribati GDP growth per capita at constant 2003 prices, indexed (2003=100) (Source: Kiribati National Statistics Office)

The amount spent on fuel subsidies is substantial from the perspective of GDP. During 2011 and 2014 the estimated post-tax subsidy would have been between 4.0 and 4.7 per cent of Kiribati GDP. This is one of the highest in the region. For example, in Fiji the total subsidy for petroleum products was 0.13 per cent of GDP in 2011 (IMF, 2013). Comparison with other countries can be seen in Figure 17. While in Kiribati post-tax subsidies on consumption of petroleum products are on a level comparable to Indonesia and about half of Venezuela in terms of percentage of GDP, several other PICTs had no subsidies at all, according to the price-gap approach. These include Solomon Islands, Tuvalu, and Vanuatu in 2011. Subsidies on fossil fuels have the potential to create economic inefficiency due to distorted prices and wasteful consumption (IEA; OPEC; OECD; World Bank, 2010). Removing them could thus help Kiribati achieve higher rates of growth.

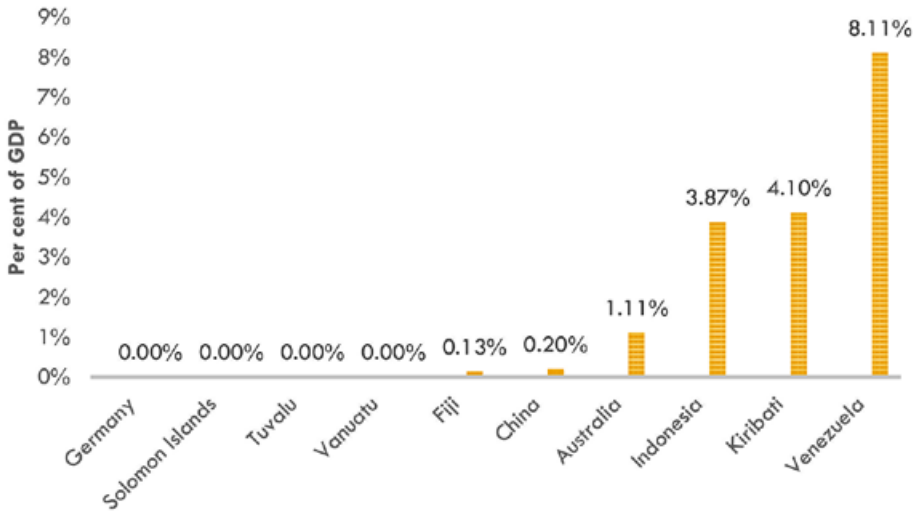

Figure 17. Post-tax subsidies of petroleum products as a percentage of GDP in 2011 in selected countries. For Kiribati the tax regime in force in May 2016 has been used. (Source: IMF, 2013 and author's calculation for Kiribati)

6.2 Fiscal impact

The government of Kiribati has a limited revenue base and a high dependence on imports. For this reason, according to the Government of Kiribati (2014b), the country remains highly vulnerable to external shocks, particularly volatility in food and fuel prices. Nevertheless, the government continues to spend a considerable amount of funds on subsiding petroleum products. The post-tax subsidy estimate for 2011 is equal to approximately 8.6 per cent of government revenue in 2011, including corrective taxes for the cost of negative externalities such as greenhouse gas emissions and road accidents. This figure is also high when compared to other countries in the world (see Figure 18). What makes this figure more important is that Kiribati had a long record of budget deficit each year from 1999 until 2013, although in 2014 and 2015 the government was able to turn it into a surplus.

As pointed out by Davies and Sugden (2010), it is also possible to have positive fiscal consequences from the increasing price of oil in terms of higher tax revenues. However, the Kiribati government does not place *ad valorem* taxes such as VAT on the main fuels. The imposed excise tax on imported fuels is based solely on the volume of fuel imported and not on the unit value and thus does not increase with increased fuel prices.

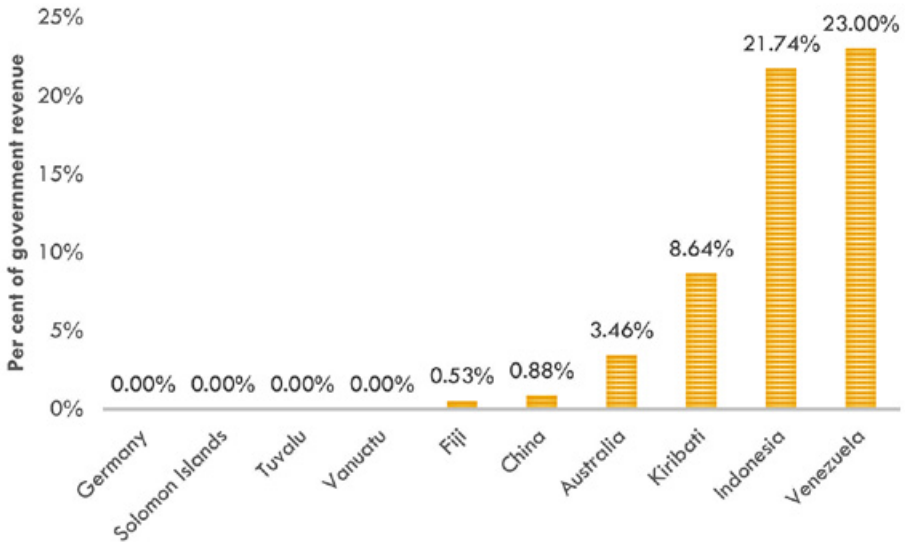

Figure 18. Post-tax subsidies of petroleum products as a percentage of government revenue in 2011. For Kiribati the tax regime in force in May 2016 has been used. Source: IMF, 2013 and author's calculation for Kiribati.

The Ministry of Finance and Economic Development acknowledges that 'in the past there has been significant growth in SOE subsidies' (MFED, 2014, p. 10). According to their estimate, in 2014, total subsidies, grants, and other commitments accounted for AUD 22.7 million, which at 19 per cent of government recurrent expenditure is substantial. However, it may all not be classified as subsidies. It included an AUD 5.3 million subsidy on copra price and an AUD 163,000 subsidy on domestic airfares. The figure may not cover consumer subsidies such as tax breaks, which do not appear in government accounts. The total worth of external grants received by the government in 2010 was recorded at AUD 55.8 million (Government of Kiribati, 2014b). In addition to receiving domestic support, the petroleum sector has been supported by grants from Japan and South Korea (Ministry of Public Works and Utilities, 2009).

The estimated total post-tax subsidy appears to be higher during years of high oil prices and lower during years of lower oil prices. As discussed in more detail in Section 6.3, Kiribati is highly vulnerable to global oil prices. Since subsidies tend to increase the volume of petroleum products used, they are likely to magnify the effect of volatility

in world prices. Kiribati cannot isolate itself from the effects of changes in world prices of petroleum products by controlling fuel prices. What this does is shift the risk associated with world prices from consumers to the government. Of course, citizens of Kiribati will still carry the risk indirectly through, for example, reduced government spending elsewhere or the need to increase taxes. The most effective way to reduce the county's vulnerability to global oil prices is to reduce its reliance on fossil fuels. UNDP declares, 'Reducing the oil intensity of development is no longer a matter of choice. It is the only course' (UNDP, 2007, p. 116).

Although the government was running on deficit for a long time, it does have quite large reserves at their disposal. In December 2014, the value of the Revenue Equalisation Reserve Fund (RERF) was at AUD 679 million (MFED, 2014). This was about 5.5 times the recurrent annual expenditure and provides a buffer for any external shocks to the fiscal balance. At the same time, according to MFED (ibid.) the present value of debt was only around AUD 28 million. These figures suggest the government has a healthy balance sheet and would be able to withstand periods of financial stress over several years. The World Bank also does not classify Kiribati as being under high risk of debt distress (MFED, 2015).

Figure 19 compares the estimated amount of fuel subsidies with education and health care expenditure in Kiribati from 2011 to 2014. During this period, the estimated subsidy on petroleum products was on average equivalent to 42 per cent of education expenditure and 53 per cent of health expenditure. From a public finance perspective, assuming the government is aware of the full implications of the subsidies, this implies that the government of Kiribati is expecting the (marginal) consumption of benzene, diesel and kerosene to have at least as high a return on public welfare as (marginal) investment in education and health care. If this is not true, then the government should move funds spent on subsiding the consumption of fossil fuels into education or health care. The amount spent on subsidies could be used to substantially increase government expenditure on education and health, or other public services. The distributional impact of subsidies, and who they actually go to, is discussed in Section 6.5.

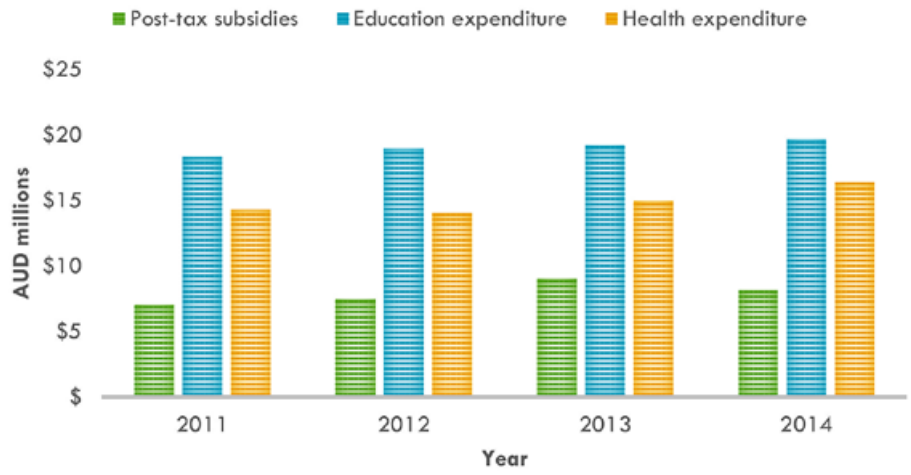

Figure 19. Estimated spending on petroleum consumption subsidies (using the May 2016 tax regime), and actual education and health expenditure in Kiribati 2011–2014 (Source: Kiribati (National Statistics Office) and author's own calculations)

6.3 Balance of payments

Until 2013, the current account balance[14] of Kiribati was mostly negative (see Figure 20). However, in 2013 and 2014 the balance was positive due to significant increases in primary income.[15] Because Kiribati exports very few goods, the balance for goods has been well into the negative. In 2013, the trade deficit was 65 per cent of GDP (MFED, 2014). The same year, petroleum products imported by KOIL accounted for 26 per cent of all goods imported in value. At the same time, the value of petroleum products imported slightly exceeded all exports of goods and services from Kiribati. As a comparison, in low income, Asia oil imports account for just 20 per cent of the export of goods and services (Davies & Sugden, 2010).

Figure 20. Kiribati balance of payments (Source: Kiribati National Statistics Office data)

Despite the trade deficit, the flow of income into the country has been strong enough to significantly reduce the current account imbalance up to 2013 and to make it positive in 2013 and 2014. In fact, these flows into the country seem to have resulted in greater imports and an even greater imbalance on goods in 2013 and 2014.

International oil prices can also affect balance of payments. During periods of higher oil prices, more money is spent on importing fuels. This deteriorates the current account balance, especially in countries that spend relatively more on fuel imports. According to a study by UNDP (2007), least developed countries (LDCs) in Asia-Pacific, such as Kiribati, suffered a bigger depreciation of current account balance as a result of an increase between 2003 and 2006 in the international price of oil compared to non-LDCs in the region. Kiribati and other PICTs were among the worst affected, highlighting their vulnerability to international oil prices. A study by Davies and Sugden (2010) compared the impact of commodity price increases on terms of trade in 2008 in 31 countries and showed that, as a percentage of GDP, the value of net imports increased more in Kiribati than in the other countries, mainly as a result of petroleum imports. Since subsidies on petroleum encourage people to consume more, this amplifies the magnitude of the negative effect. Because in Kiribati prices of fuels have remained almost constant since 2009, international prices are not generally passed on to consumers, and the risk related to volatility in oil prices is carried by the government instead of the businesses and households consuming fuel. This means that, during periods of high oil prices, the government has to subsidise fuel prices more than during periods of low oil prices, creating

14 Current account balance measures the net flows of goods and services, payments to labour, capital, and other factors of production, and other international transfers to (positive) and from (negative) in the country.

15 Primary income means income from production processes, property income or rent, such as compensation of employees, or rent from use of natural resources (e.g. fishing licences).

potential volatility in government finances. However, in Kiribati, even at the falling oil prices in 2014, the goods balance does not show an improvement as a response.

Davies and Sugden (2010) argue that policies that reduce reliance on imported fuels contribute to macro-economic growth, stability, and poverty reduction. Kiribati is already highly reliant on imported fuel as the main source of energy for transport and electricity and subsidies are likely to increase this reliance. Thus, policies to reduce these subsidies can potentially contribute to macro-economic growth and stability as well as poverty reduction. This statement by Davies and Sugden also goes against what seems to be the main reasoning behind the subsidies, i.e. supporting poor households. Other authors also suggest that targeted transfers or other social policy instruments are in general a better way to support the population than generalised subsidies (see, for example, Komives, Foster, Halpern, Wodon and Abdullah, 2005; and Sdralevich, Sab, Zouhar and Albertin, 2014). Since subsidies increase fuel demand, part of the subsidy benefits foreign oil producers, distributors and shippers.

6.4 Inflation

High oil prices not only deteriorate the balance of payments for imported oil products, but they can also result in increases in the prices of goods and services. This is what happened in 2009, when average inflation in PICs hit almost 10 per cent with unsustainable imbalances in trade and current account balances (Davies & Sugden, 2010). For small island states, inflation levels and price indices such as the Consumer Price Index tend to follow international oil prices (see ibid; Policy Unit, 2015). One reason for this is that in small islands states a large share of goods consumed are imported by means of air or sea transport. The share of freight costs in the price of imports tends to be high in these locations and freight costs are influenced by oil prices.

This is what happened in Kiribati, according to data from the national statistics office, with the Retail Prices Index (RPI) hitting almost 24 per cent by the last quarter of 2008. In principle, the almost constant prices set for gasoline, diesel, kerosene and electricity since 2009 should have reduced the volatility in prices. Indeed, Kiribati RPI has not shown such high inflation rates since 2009, even when world oil prices have increased. It must be kept in mind that, in USD terms, prices in Kiribati still seem to follow the world oil prices to some extent. The constant prices reduce the risk faced by businesses and households consuming these energy products. However, it does not remove the price risk from the country, but merely moves it from consumers to the government. Moreover, when fuel subsidies to lower the price of fuels exist, the volume of fuel consumed is higher than it would be without subsidies. This means that the overall risk faced by Kiribati is higher, with subsidies making the overall economy more vulnerable to oil price volatility. Price risk to households and businesses related to volatility of world oil prices could be reduced by, for example, automatic pricing mechanisms without implying a reduction in fuel prices (and thus subsidies).

Benzene and diesel, but kerosene much less so, are used as intermediate inputs for the production of other goods and services in Kiribati. Businesses use such things as land transport vehicles or private diesel generators. Thus an increase in the prices of benzene and diesel could lead to increases in the price of these goods and services, which again can lead to further increases in other goods and services that they are inputs to. In addition to reducing the use of these fuels as intermediate inputs, countries can avoid such inflationary pressures by an active and predictive monetary policy. However, since Kiribati does not have a currency of its own, it does not have these tools at its disposal. There were no data available (such as supply use tables) for the study on how significant fuel and fuel-related intermediate costs, such as land transport, are to businesses. This would have permitted the estimation of these indirect impacts. However, considering the geography of Kiribati, it is likely that sea transport costs are much more important and land transport costs contribute only a small fraction to the overall cost of goods and services.

6.5 Distributional impact

We have estimated that millions of dollars are spent on subsidising fossil fuel consumption in Kiribati. But who are the beneficiaries of these subsidies and who are most likely to lose as a result of the subsidies?

Figure 21 shows how the total benzene sold by KOIL in 2014 was distributed to different user groups in the Gilbert Islands. The estimated post-tax subsidy on benzene was about AUD 3.4 million in 2014. Figure 21 gives an idea how that amount is shared among the direct beneficiaries of the subsidy. As can be seen, there are two main users: fishing vessels and land transport. Both of these receive a subsidy of over one million AUD on their benzene purchases in the Gilbert Islands only. Unfortunately, the data do not show how much of the land transport share was for public transport and how much for private vehicles. Whatever the share, part of the subsidy is pocketed by private vehicles owners who, in most developing countries tend to be from wealthier households, whereas public transport is more commonly used by lower income households. In studies elsewhere in the world it has been found that well over half the benefits of subsidies on benzene goes to the top household expenditure quintile (Coady, Flamini, & Sears, 2015). If the government of Kiribati wants to support public transport for poorer households, it should find better targeted ways of doing this than a general subsidy on benzene.

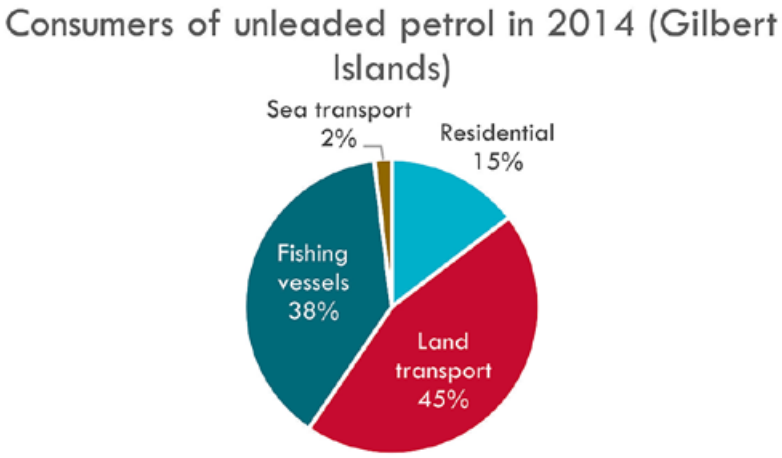

Figure 21. Share of unleaded petrol (benzene) volume consumed by different consumer groups in 2014 in the Gilbert Islands (Source: SPC and Government of Kiribati data)

A breakdown of diesel (ADO) consumption in Gilbert Islands in 2014 can be seen in Figure 22. In 2014, the total subsidy to diesel fuel is estimated at AUD 3.3 million. The share of PUB for electricity generation is about half of this (estimated at around AUD 1.6 million in 2014). PUB also receives a subsidy of AUD 0.6 per litre plus VAT, but on the other hand some elements of the corrective tax are not applicable to PUB's diesel consumption.[16] To find out who eventually receives this subsidy it is necessary to look into the structure of PUB's clients as well as PUB itself. It is important to understand that PUB's staff and suppliers of other inputs are likely to be beneficiaries of this subsidy as well[17], and a further analysis of electricity production, distribution and consumption would be required to determine who actually benefits and by how much.

16 These include for example accidents and road damage. It is assumed that PUB and other users can be charged different diesel prices in practice and no smuggling from diesel supplied for uses with lower tax occur to uses where higher tax should be applied. This makes it possible to apply different corrective tax rates for different user groups. On the other hand, this may not be possible between sea transport and land transport uses and thus the same level of excise is applied to both in the price-gap estimates.

17 Subsidies can be an incentive for inefficiency. Instead of being transferred to consumers, subsidies to public utilities can transform into excess costs, benefiting utility employees and contractors (Komives, Foster, Halpern, Wodon, & Abdullah, 2005)

After electricity production, land transport consumes most of the remaining volume. The biggest consumers are heavier vehicles such as trucks and minibuses used by businesses. Part of this benefit goes to public land transport passengers, many of who tend to be members of lower-income households. However, due to lack of data, it is difficult to estimate how much goes to each beneficiary and, as with benzene, it is possible that a part goes to wealthy private vehicle owners. In land transport, benzene and diesel have a high rate of substitutability, meaning that if diesel is subsidised more than benzene, transport users favour diesel vehicles. Because of this, setting a different level of subsidy on diesel and benzene can be problematic. The current pricing structure favours benzene vehicles over diesel vehicles.

About one tenth of diesel consumed goes to domestic sea transport. Domestic sea transport can thus be considered to benefit from at least two kinds of subsidies, the freight subsidy and the subsidy to diesel fuel.

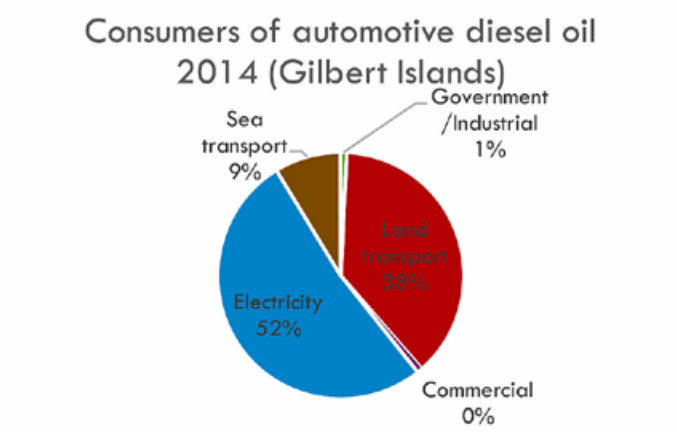

Figure 22. Share of diesel volume consumed by different consumer groups in 2014 in Gilbert Islands (Source: SPC and Government of Kiribati data)

About half of the kerosene imported is destined for aviation. The rest is consumed by households and community and social services. The kerosene subsidies estimated in this report concern only non-aviation uses and was estimated at AUD 0.9 million post-tax in 2014. No data were available on the price of aviation kerosene, but it is not subject to price control and is therefore likely to be priced higher than household kerosene. Household kerosene subsidies are sometimes considered a form of good subsidy targeting. This is because, in some countries, kerosene is used more frequently by lower-income households than by higher-income households. Thus benefits of kerosene subsidies can better reach poor households with less leakage to higher-income households. However, there does not seem to be evidence to support this argument in Kiribati. According to the 2006 Household Income and Expenditure Survey (HIES) kerosene stoves were commonly used as the primary cooking energy source in South Tarawa by both lower and higher income households (KNSO; UNDP, 2010) (see Table 4). On outer islands, kerosene burners were in fact more commonly used for cooking by higher-income households. Kerosene was also much more frequently used in South Tarawa than in other Gilbert Islands and the Line and Phoenix Islands. This picture is confirmed by the 2010 census, although the total number of households using mainly kerosene for cooking had dropped slightly (National Statistics Office, 2012). This suggest that the AUD 0.9 million spent on subsidising kerosene goes mostly into the pockets of South Tarawa residents and some wealthier households on other islands.

Table 4. Percentage of households using kerosene as the primary cooking energy by geographical location and household expenditure level (Source: KNSO; UNDP, 2010).

	South Tarawa	Rest of the Gilbert Islands	Line and Phoenix Islands
Bottom expenditure quintile	75.9 %	2.2 %	13.5 %
Top expenditure quintile	74.8 %	22.2 %	37.4 %
Average	72.5 %	9.3 %	18.7 %

In terms of lighting, according to the HIES data, kerosene does not seem to be used much in South Tarawa and the Line and Phoenix Islands for lighting, although it appears to be more common in lower-income households and hardly used at all by higher-income households. In the rest of the Gilbert Islands, however, kerosene is commonly used and more so by lower-income households (see Table 5). The geographical distribution is similar in the 2010 census but the number of kerosene lighting users seems to have increased (National Statistics Office, 2012). From the perspective of supporting poorer households, subsidising kerosene for lighting instead of cooking seems to make better sense, but at the moment there does not appear to be strong evidence to support subsidies on kerosene. Apart from lighting by some poorer households, the majority of kerosene seems to be going for cooking by a large number of South Tarawa households of all income groups.

Table 5. Percentage of households using kerosene as the primary lighting energy source by geographical location and household expenditure level (Source: KNSO; UNDP, 2010).

	South Tarawa	Rest of the Gilbert Islands	Line and Phoenix Islands
Bottom expenditure quintile	10.8 %	63.5 %	8.7 %
Top expenditure quintile	0 %	30.4 %	6.8 %
Average	5.9 %	45.3 %	10.1 %

Of course, the HIES data from 2006 is outdated and a new HIES would be required to validate the data. Since the 2006 HIES and 2010 census, there have been efforts to provide solar lighting to the outer islands. KSEC has been distributing solar lighting kits to outer islands with funding from the Taiwanese government. They report to have distributed a total of 11223 solar lighting kits to the outer islands (including Line and Phoenix Islands) (KSEC, 2016). Thus, if the distribution of the kits has been successful, it can be assumed that most households in outer islands now have access to solar lighting and there is no need to continue subsidising kerosene as a lighting fuel.

There is a wide disparity between Tarawa and the outer islands in terms of lower delivery of health, education, water and sanitation services (Government of Kiribati, 2014a). As we have seen, instead of subsidising fossil fuels, the government could increase spending on public services such as health and education. We have also seen that a lot of the benefit of the subsidies goes to South Tarawa, including kerosene used for cooking and the use of diesel for electricity generation. The use of private vehicles may also be more common in South Tarawa than in the outer islands. There are reasons to believe that subsidies on diesel and benzene are likely to benefit wealthier households more than the poor. In addition, although the overall geographical impact of the subsidies could not be estimated due to lack of data, it is possible that residents of South Tarawa benefit proportionately more than residents on outer islands. If this is the case, the subsidies could also contribute to migration from outer islands to already crowded South Tarawa as people desire better and cheaper access to electricity.

We have seen that households benefit directly from fuel subsidies in different ways. Private vehicle owners are able to use cheaper benzene and diesel fuel for their vehicles, and kerosene for cooking and lighting is cheaper. Households may also receive indirect benefits from using goods and services from businesses that use subsidised

fuels as inputs to their businesses. These include electricity and public transport, although further analysis would be required to confirm who receives the benefit and how much of it. Any subsidy on intermediate goods does not necessarily convert into a benefit for households consuming the final product. At least part of the subsidy is likely to go to business owners, employees and creditors, etc.

When looking at how the benefits of the subsidies are distributed amongst poorer and wealthier households, the picture is restricted by lack of data. However, there is reason to believe that a substantial part of the subsidy goes to non-poor households. Still, if subsidies were removed and fuel prices increased, households would need to adjust their expenditure accordingly. Poor households would need to adjust to the new prices in ways that may have a greater negative impact for them than for wealthier households. UNDP (2007) lists how poor households might cope with the change. These include:

- using inferior fuels;
- using more biomass or dung cakes instead of kerosene for cooking;
- doing without lighting;
- walking to school or health centre instead of taking the bus;
- urban workers from rural areas returning to their home villages less frequently;
- urban poor not having the option of collecting and using biomass;
- rural poor without access to electricity being more vulnerable to higher prices of lighting fuels;
- rural poor being disadvantaged by higher transport costs; and
- women and children needing to spend more time collecting fuel wood or taking on extra work.

Apart from subsidies to diesel inputs, electricity subsidies are not estimated in this report. Nevertheless, ITP (2014, p. 47), commenting on the electricity supply in Kiritimati in its report, concludes that: 'There is an obvious need for structural and tariff reform, although the latter may prove to be politically difficult to implement'. ITP refers to consultations with the German Agency for International Cooperation (GIZ), which found that many already find electricity prices unaffordable. However, this does not mean that there are no policy options for reform. First of all, subsidies on fossil fuels could be moved to other products consumed by poor households and thus prevent overall expenditure levels of households from increasing. This could avoid the negative externalities of consuming fossil fuels and at the same time achieve better targeted support for the poor. Tax breaks or cash transfers for low-income households could also be considered, though effectively targeting the poor would incur administrative effort and costs. In electricity production, incentives could also be moved away from fossil fuels and into cleaner forms of energy, at least to make the playing field more level if not in favour of renewable energy. Non-linear electricity tariffs could also be considered to set different unit tariffs, based on the quantity of electricity consumed by a household. It would make electricity more affordable to those who consume little (with a lower unit tariff) while at the same time obtaining full cost recovery from households consuming more.

6.6 Environmental impact

Consumption of fossil fuels causes greenhouse gas (GHG) emissions. Since subsidies on fossil fuels stimulate the demand for them, the increased consumption also leads to higher levels of GHG emissions. During the years 2011–2015 the estimated subsidies would have increased CO_2 emissions by 4.4 kilotons (kt) per year on average.[18] This is equivalent to 7.5 per cent of total emissions from benzene, diesel and kerosene over the period. The latest greenhouse gas inventory by the Kiribati government estimated total CO_2 of 64.8 kt in 2008 (MELAD, 2013). Assuming similar CO_2 levels in 2011–2014 this means elimination of subsidies on benzene, diesel and kerosene alone could cut Kiribati CO_2 emissions by almost seven per cent. However, this is likely to be an overestimation, since total emission levels in 2011–2014 were possibly higher than in 2008. Nevertheless, the subsidies can be said to be a significant

18 Estimated based on price elasticity of demand of –0.4 for all fuels (Parry, 2009). CO_2 emissions of 2351.1 grams per litre was used for benzene and 16 per cent more for diesel and kerosene (IMF, 2013 and Parry, 2009).

contributor to Kiribati CO_2 emissions. Eliminating subsidies to benzene, kerosene and diesel would also make up for a large share of Kiribati's INDC commitment (Republic of Kiribati, 2015) of cutting emissions by 13.7 per cent by 2025.

Additional greenhouse gas emissions from burning fossil fuels are not the only environmental effect of fossil fuel subsidies. Particularly, indoor air pollution due to the use of kerosene for cooking and lighting can have a detrimental effect on human health, with some evidence of increased risk of diseases such as tuberculosis, asthma and cancer (Lam, Smith, Gauthier, & Bates, 2012). Higher amounts of fuel transported and consumed within Kiribati waters also increase the risk of oil spills, which, according to the government, are already a challenge (Government of Kiribati, 2014b).

The Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management, or KJIP (Government of Kiribati, 2014b) outlines strategies, some of which make subsidies to fossil fuels seem counterproductive. Strategy 9 is called 'Promoting the use of sustainable, renewable sources of energy and energy efficiency'. One of the expected results of this strategy is the increased share of renewable energy sources in the energy mix, including strengthening the capacity to use coconut oil for biofuels. Another expected result is an increase in energy efficiency and conservation measures. This includes developing a policy to 'guide and enforce' efficient use of energy in the transport and energy sectors, including a financing mechanism for energy efficiency, as well as a reduction in the intensity of conventional energy used. The continued provision of fossil fuel subsidies would undermine the effectiveness of any such policies. The government could end up with policies that function in an opposite manner, resulting in a waste of resources due to administrative and transaction costs. Indeed, fossil fuel subsidy reform could be one of the most effective policies to reach these targets.

The total financial cost for strategy 9 is AUD 15.34 million. Yet, at the same time, the Kiribati government spends millions of dollars a year subsidising fossil fuels (estimated on average AUD 7.1 million a year on the three main fuels, excluding possible subsidies on electricity consumption), which is completely contrary to its stated policy objectives. Subsidising fossil fuels makes renewable energy sources such as solar or biofuels relatively more expensive and thus less competitive in the national energy market. This can further increase the negative impact on GHG emission levels, which is not taken into account in the above estimate.

The funds currently spent on fossil fuel subsidies could also be invested in renewable energy to further mitigate greenhouse gas emissions while reducing dependency on imported fuels. The Kiribati Integrated Energy Roadmap: 2016–2025 estimates that a USD 9.8 million investment into a photovoltaic and storage system in South Tarawa would increase the share of renewable energy in electricity production to 31.5 per cent (IRENA; SPC; PPA, 2016). This required one-off investment is only slightly higher than the estimated annual subsidy (excluding any possible subsidies on consumption of electricity produced by diesel), and could potentially be covered by the savings from eliminating subsidies.

7. Recommendations

We have seen several negative effects of fossil fuel subsidies in Kiribati. They mean a substantial loss of government funds and increased financial flows out of Kiribati. They make the country more dependent on fossil fuels and more vulnerable to the volatility of world market prices. They significantly increase greenhouse gas emissions, and are likely to aggravate detrimental health effects of kerosene use. They also distort the economy, leading to economic inefficiency. Furthermore, the evidence, although limited, suggests that subsidies are poorly targeted to support poorer households. Thus it is recommended that the Kiribati government replace fossil fuel subsidies by better targeted policies.

However, seeing how resources are wasted on fossil fuel subsidies is only the first step. Reforming the subsidies in practice can be difficult. Fuel subsidies are a politically sensitive topic and many governments have struggled to successfully implement reforms mainly due to resistance from the public, businesses and vested interests. Because of this IMF (2013) recommends six key elements for a successful reform:

- a comprehensive energy sector reform plan, including clear objectives, stakeholder consultations, and analysis of impact;
- an extensive communication strategy for dissemination of information about the magnitude of subsidies and their impact;
- gradual withdrawal of subsidies as appropriate;
- improving the efficiency of state-owned enterprises. This would reduce the amount of subsidies going to the producer;
- better targeted policies to support the poor; and
- the introduction of institutional reforms, such as automatic pricing mechanisms that depoliticise energy pricing.

In designing a reform plan, the government of Kiribati is urged to take note of these key elements. Analysing the direct impact of subsidies without updated HIES is difficult and it is recommended that the government undertake a new HIES to support, not just the subsidy reform, but other policy-making as well. Analysing indirect impacts of subsidies would also require an input-output table for the economy, which is currently not being produced. Keeping these limitations in mind and considering the data that were available for this analysis, it is specifically recommended that the Government of Kiribati undertake the reforms described below.

- Replace wholesale and retail price controls of fuels with an automatic pricing mechanism (covering benzene and kerosene, as well as diesel and oil 50) to independently set the prices of fuels based on world market prices and benchmarked transport and distribution costs. Techniques to decrease price volatility, such as price bands or a moving average could, at least initially, be included in the price formula. A period of lower world oil prices, such as at the time of writing this report, is a good moment to introduce such reforms, since eliminating subsidies requires a smaller increase in the price of fuel. Thus such reforms may encounter less resistance during periods of lower oil prices.
- Introduce 12.5 per cent VAT on all fuels. Current VAT exemption creates a market distortion in favour of fossil fuel consumption. In order to avoid this distortion, the same level of VAT should be applied to fuels as other goods and services.
- Readjust excise on fuels to more accurately reflect the negative externalities of their consumption. The analysis suggests that current levels of excise are too low. Benzene excise is currently AUD 0.07 per litre, whereas the estimated corrective tax for 2011–2015 is AUD 0.19 (see Appendix 1 for details). Diesel excise is currently AUD 0.06 per litre, which is also lower than the estimated corrective tax of AUD 0.18 for non-PUB consumption. Kerosene currently has no excise duty to account for GHG emissions and adverse health effects from burning kerosene. The estimated corrective tax is AUD 0.10 per litre.

- The reforms should be gradually introduced to allow households and businesses sufficient time to understand the reason for reform and to prepare themselves for the changes. Gradual reform would make sure that the adverse effects of the reform are spread over a period of time and not applied all at once.
- Design and implement a communication strategy to inform the public about the size and negative effects of fossil fuel subsidies. The public should be informed about these factors before attempting to implement the reforms.
- Fully account for subsidies, including tax exemptions and price controls, in government financial accounts. This would increase the transparency of government finances and financial reporting with regards to subsidies.

The aforementioned reforms should be accompanies by policies to support those who might lose out as a result of removal of the subsidy. Particular attention should be paid to poor households and other vulnerable population groups. The proposed policies to address this, discussed below, could be permanent or temporary in nature.

Benzene

The two biggest uses of benzene are fishing and land transport. In the Gilbert Islands, the average estimated subsidy in 2011–2014 received by fishing is about AUD 1.2 million per year. The benzene used for fishing is mainly for local boats with an outboard motor. Oil 50 is also used for outboard motors, so any reform should consider it as well. Estimating the result of removing subsidies on the local fishing industry would require a better understanding of fishing in Kiribati, which is outside the scope of the study. Nevertheless, it can be said that it is likely that, after removal of subsidies on benzene, the price of fish could increase, leading to lower consumption of local fish and possibly lower earnings for fishermen. Whether these changes would be big or small is difficult to say. It is thus recommended that, when designing the reform of benzene subsidies, the outcome for the fishing industry is studied in more detail.

According to the 2010 census (National Statistics Office, 2012) less than ten per cent of households own cars, and it can be safely assumed that these are mostly owned by higher-income households. Out of these households, 83 per cent are in South Tarawa. Motorbikes are owned by only around 24 per cent of households. However, the census data also show that motorbike ownership is spread all over Kiribati, with only 25 per cent of households owning a motorbike living in South Tarawa. The data are from 2010 and it is possible that vehicle ownership has grown since the census. Compared to cars, motorbike ownership is probably more common in lower-income households; although most motorbikes are still likely to be owned and used by middle- or higher income households. The poor may be relying more on public transport but the vehicles used for public transport are likely to run more often on diesel than benzene. As already pointed out, there are studies from other countries supporting the view that subsidies on benzene mostly benefit the wealthy and this may well be the case in Kiribati too. The poor benefit hardly at all. From this perspective there does not seem to be any justification to continue spending considerable amounts of public funds to subsidise benzene for cars and motorbikes, since it is in essence a transfer from the government to the wealthier households. However, it can be politically challenging to remove the subsidy, since it affects the interests of the wealthy, who often tend to be the most influential people as well.

Removing subsidies from benzene can, however, have indirect consequences, since businesses require transportation of goods as intermediate inputs in their production processes. This means that removing subsidies can affect the prices of goods and services other than benzene and can create inflationary pressures. As discussed in Section 6.4, since Kiribati does not have its own currency, the government has limited tools for dealing with these inflationary pressures. Moreover, land transport costs related to benzene might be relatively small to Kiribati businesses due to its geography. If this is true, then the indirect consequences of increasing benzene prices would be limited as well.

Overall, subsidies on benzene appear to be poorly targeted with significant leakages to wealthier households. Thus, the universal subsidy on benzene should be removed. For land transport, the data, although limited, do not suggest a need from an economic perspective for policies to compensate those who lose as a result. The consequences of removing these subsidies on the fishing sector should be studied in more detail. If necessary, policies to support the fishing sector alone could be designed to replace the subsidy to all benzene users.

Diesel

About half of the subsidy to diesel is on fuel sold to PUB for electricity generation and this should be looked at in connection with electricity pricing and production. Electricity prices and subsidies were not part of this study and would need to be further examined to support the plan of reforming the subsidies on diesel supplied to PUB. As mentioned earlier, diesel forms over 65 per cent of the operating costs of PUB (Tonkin & Taree, 2016). The electricity produced by PUB is supplied only to the residents of Tarawa. It is also reasonable to assume that wealthier households consume more electricity. This has been seen in studies elsewhere (see Coady, Flamini and Sears, 2015 and Komives, Foster, Halpern, Wodon and Abdullah, 2005). Thus, the subsidy on PUB's fuel, estimated at about AUD 1.6 million in 2014 is going exclusively to South Tarawa residents with a higher benefit for wealthier households in general. There are techniques available to target different energy prices to the poor, such as non-linear tariffs that have lower unit tariffs for those who consume less. These could be a potential solution for making electricity affordable to the poor while charging full cost-recovery prices to wealthier households. If electricity prices increase this may have indirect consequences as well. However, Kiribati is already applying a higher electricity tariff to business users. This price may already be closer to a cost-recovery price and require less adjustment if subsidies are removed. Although electricity pricing should be looked at in more detail, in principle it is recommended that the government look into non-linear tariffs rather than a universal subsidy on diesel inputs for electricity production because of its potential for better targeting poorer households.

Apart from electricity production, diesel is used for land and sea transport. Land transport has already been discussed above under benzene. However, unlike benzene, diesel is more likely to be used by trucks and buses than private cars. Thus there may be greater indirect consequences from removing the diesel subsidy but, as discussed above, the consequences may still be small due to the limited role of land transport for businesses. The diesel retail price also has the lowest subsidy per volume of the three studied fuels. Thus for diesel it would require a smaller price increase to reach the full cost-recovery price. Increasing public transport fees can be something that specifically affects lower-income residents. To compensate for this, it would be better to look at subsidies or price controls directly on public transport fares rather than a universal subsidy on diesel. Because of this potential negative effect on poor households, it would be worth taking a closer look at public transport fares in the context of both diesel and benzene.

Domestic sea transport of goods already benefits from the import levy fund-based subsidy. This and the price control system were already reviewed by the Centre of International Economics (2015) and the government should take note of its findings and recommendations and consider these in connection with the removal of subsidies on diesel. One of the findings of the report was that the import levy fund arrangement has a limited effect on poverty or food security.

An important issue to keep in mind when reforming diesel subsidies is its substitutability with benzene. Thus, any gradual reforms on diesel should be done in tandem with reforms on benzene subsidies.

Kerosene

Since the subsidised kerosene is used for cooking and lighting, removing the subsidies would have a direct effect on households. Indirect effects on the prices of other goods and services would be limited, since kerosene is not used as an intermediate input by businesses on a large scale. Based on data from KOIL, in the Gilbert Islands annual kerosene sales per household was on average AUD 74.07 during 2011–2014. If subsidies were eliminated, annual expenditure on kerosene would have to go up by AUD 50.69 on average (or just under a dollar per week) to maintain the same level of consumption. In the 2006 HIES, the lowest expenditure quintile of households in Kiribati had a weekly expenditure of AUD 70.66 (KNSO; UNDP, 2010). For illustrative purposes a one dollar increase in weekly kerosene consumption would mean a 1.4 per cent increase in expenditure for households in the lowest expenditure quintile. This would be the case, assuming all households use the same amount of kerosene regardless of their income level and that all household expenditure levels have remained at a same level since 2006. However, as we have seen in terms of cooking, kerosene is used by households of all income levels, and particularly in South Tarawa. According to HIES, in South Tarawa the lowest quintile average weekly expenditure was AUD 145.69 and highest quintile expenditure was AUD 379.30. Thus, even for the lowest quintile, eliminating kerosene subsidies would result in a modest 0.7 per cent increase in expenditure.

According to latest data, kerosene is used for lighting mainly in the Gilbert Islands[19] outside of South Tarawa. However, since the recent distribution of solar lighting kits to outer islands by KSEC, the use of kerosene would have likely decreased, with most families having access to solar lighting. Thus kerosene subsidies may no longer be necessary from the perspective of providing lighting to outer islands. Eliminating the subsidies would further encourage the use of solar lighting and taking care of the kits.

Eliminating subsidies on kerosene would not seem to have major negative consequences for vulnerable groups. In general, the increase in the price of kerosene could be compensated by providing better education, health and other public services to the population. These could be funded by the VAT and excise duty imposed on kerosene. In case the Kiribati public is not convinced by the reform, the government could consider abolishing some fees of public services in exchange. An example is school fees, with an estimated revenue of AUD 152,936 for 2017 (Kiribati Government, 2014), which is well below the estimated cost of subsidy to kerosene. Still, there may be some poorer households that would suffer from the increase in the cost of cooking fuel and this should be taken into account in the design of the reform. In a previous study, SPC looked into encouraging kerosene users to switch to LPG burners and this study could be referred to when designing the reform (SPC, 2015).

19 According to HIES 2006, 95 per cent of households using primarily kerosene for lighting are located in the Gilbert Islands outside of Tarawa (KNSO; UNDP, 2010). According to the 2010 census, the figure was 84 per cent (National Statistics Office, 2012).

8. Conclusion

Kiribati spends a considerable amount of resources on subsidising fossil fuels. Using the current tax regime implemented in the 2014 tax reform retrospectively on 2011–2015, it is estimated that, on average, post-tax subsidies on benzene, diesel and kerosene totalled AUD 7.1 million per year. During 2011–2014 this is equivalent to about 53 per cent of public healthcare expenditure or between four and five per cent of Kiribati's GDP.

Not only do the subsidies have an evident fiscal impact, they are also ineffective at targeting benefits to the poor. Although sufficient data were not available to accurately measure the direct and indirect effects of the subsidies, there are reasons to believe that a considerable share of the subsidies leaks to the wealthy residents, or even oil companies abroad. In addition, the subsidies considerably increase Kiribati's CO_2 emissions and also have other negative effects such as health issues related to indoor air pollution. Evidence to support the argument that the subsidies should be maintained to help the poor is limited. These findings are in line with past studies in other developing countries. It is recommended that the government look for better targeted ways to support the poor, rather than using universal tax exemptions and price controls on fossil fuels.

It is thus recommended that the Government of Kiribati gradually eliminate all fossil fuel subsidies. This will also help substantially cut greenhouse gas emissions in accordance with Kiribati's INDC target and the Paris agreement and move Kiribati towards sustainable energy. This may be done in conjunction with policies to support those who suffer the most negative consequences due to removal of the subsidies. In order to achieve this, the government should come up with a fuel subsidy reform strategy. An important part of the strategy is to communicate the size and negative effects of subsidies to the public in order to gain public understanding prior to implementing the reforms.

References

Australian Institute of Petroleum. (2016, March 22). ***Pump prices (retail)***. Retrieved from http://www.aip.com.au/pricing/retail.htm

Bast, E., Doukas, A., Pickard, S., van der Burg, L. and Shelagh, W. (2015). ***Empty Promises: G20 subsidies to oil, gas and coal production.*** Overseas Development Institute and Oil Change International.

CIE. (2012). ***Kiribati: Review of the import levy fund and review of the price control system.*** Canberra: Centre for International Economics.

Coady, D., Flamini, V., & Sears, L. (2015). ***The unequal benefits of fuel subsidies revisited: Evidence for developing countries.*** Washington: International Monetary Fund.

Coady, D., Parry, I., Sears, L. and Shang, B. (2015). ***How large are global energy subsidies?*** Washington: International Monetary Fund.

Davies, M., & Sugden, C. (2010). ***Macroeconomic impacts of energy prices in the Pacific.*** Suva: Pacific Financial Tehnical Assistance Centre.

George Wilkenfield and Associates PTY Ltd. (2011). ***The costs and benefits of introducing standards and labels for electrical appliances in Pacific Island countries.*** Noumea: Secretariat of the Pacific Community.

Government of Kiribati. (2014a). ***Development Partners Forum. Agenda Item 5: Towards an energy secure Kiribati.*** Tarawa: Government of Kiribati.

Government of Kiribati. (2014b). ***Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management (KJIP) 2014–2023.*** Tarawa: Government of Kiribati.

GSI. (2010, March). Defining fossil-fuel subsidies for the G-20: Which approach is best? ***GSI Policy Brief***.

IEA; OPEC; OECD; World Bank. (2010). ***Analysis of the scope of energy subsidies and suggestions for the G-20 initiative.*** Submitted to the G-20 Summit Meeting in Toronto, 26–27 June 2010, Toronto.

IMF. (2013). ***Energy subsidy reform: lessons and implications.*** International Monetary Fund.

IMF. (2014, February). Data-base for getting energy prices right.

IPCC. (2006). ***IPCC National Greenhouse Gas Inventories Programme.*** Hayama: Institute for Global Environmental Strategies.

IRENA. (2012). ***Kiribati renewables readiness assessment 2012: Exploring sustainable and secure pathways towards energy independence.*** International Renewable Energy Agency.

IRENA; SPC; PPA. (2016). ***Kiribati integrated energy roadmap: 2016–2025.*** IRENA, SPC and PPA.

ITP. (2014). ***Kiritimati Island electricity sector: Scoping exercise.*** IT Power.

Kiribati Customs. (n.d.). ***Customs tariff schedule.***

Kiribati Government. (2014). ***2015 Budget.*** Tarawa: Ministry of Finance and Economic Development.

KNSO; UNDP. (2010). ***Analysis of the 2006 Household Income and Expenditure Survey: A report on the estimation of basic needs poverty lines, and the incidence and characteristics of poverty in Kiribati.*** Suva: United Nations Development Programme.

Komives, K., Foster, V., Halpern, J., Wodon, Q. and Abdullah, R. (2005). ***Water, electricity, and the poor: Who benefits from utility subsidies?*** Washington DC: The International Bank for Reconstruction and Development / The World Bank.

Koplow, D. (2009). ***Measuring energy subsidies using the price-gap approach: What does it leave out?*** International Institute for Sustainable Development.

KSEC. (2016, May 2). Distribution of Taiwan solar lighting kit (1st and 2nd batch table). Tarawa.

Lam, N., Smith, K., Gauthier, A. and Bates, M. (2012). Kerosene: A review of household uses and their hazards in low- and middle-income countries. *Journal of Toxicology and Environmental Health, Part B*, 396–432.

Matakiviti, A. (2008). ***Kiribati National Energy Policy Initial Consultation - Back to office report.*** Pacific Islands Energy Policy and Strategic Action Planning Project.

MCIC. (2010). ***Simple guide for process of prices orders: A simple procedural guideline for MCIC Staff.*** Tarawa: Ministry of Commerce, Industry & Cooperatives.

MELAD. (2013). ***Second Communication under the United Nations Framework Convention on Climate Change.*** Tarawa: Kiribati Government.

MFED. (2014). ***Annual Report 2014.*** Tarawa: Ministry of Finance and Economic Development, Government of the Republic of Kiribati.

MFED. (2015). ***Millennium Development Goals: Kiribati Progress to June 2015.*** Tarawa: Ministry of Finance and Economic Development.

Ministry of Public Works and Utilities. (2009). ***Kiribati National Energy Policy.*** Tarawa: Government of the Republic of Kiribati.

National Statistics Office. (2012). ***Report on the Kiribati 2010 Census of Population and Housing: Vol 1: Basic information and tables.*** Tarawa: Ministry of Finance and Economic Planning.

National Statistics Office. (2016a). ***2015 Population and Housing Census: Preliminary Report.*** Tarawa: Ministry of Finance and Economic Development.

National Statistics Office. (2016b, April 15). Kiribati retail price index worksheet. Tarawa.

National Statistics Office. (n.d.). Government Financial Statistics 2001-2014. Tarawa. Retrieved April 15, 2016

Parry, I. W. (2009, December). How much should highway fuels be taxed? ***SSRN Electronic Journal***.

Policy Unit. (2015). ***State of the Falkland Islands economy.*** Stanley: Falkland Islands Government.

PPA. (2015). ***Pacific Power utilities benchmarking report: 2012 Fiscal Year.*** Suva: Pacific Power Association.

Republic of Kiribati. (2015). ***Intended nationally determined contribution.***

Sdralevich, C., Sab, R., Zouhar, Y. and Albertin, G. (2014). ***Subsidy reform in the Middle East and North Africa: Recent progress and challenges ahead.*** Washington: International Monetary Fund.

SE4All. (2015). ***Progress toward sustainable energy 2015.*** Washington DC: International Bank for Reconstruction and Development, International Energy Agency.

SPC. (2012). ***Kiribati country energy security indicator profile 2009.*** Suva: Secretariat of the Pacific Community.

SPC. (2013). ***Gilbert Island Group energy statistics yearbook 2000–2009.*** Suva: Secretariat of the Pacific Community.

SPC. (2015). ***An economic analysis of kerosene subsidy policy reform: Towards promoting sustainable use of LPG in Kiribati.*** Suva: Secreatariat of the Pacific Community.

Tonkin, P., & Taree, T. (2016, April 22). Overview of the Public Utilities Board. (V. Peltovuori, Interviewer)

UNDP. (2007). ***Fuel to change - Overcoming vulnerability to rising oil prices: Options for Asia and the Pacific.*** Bangkok: United Nations Development Programme.

UNEP. (2016). ***Green economy fiscal policy analysis - Kenya.*** United Nations Environment Programme.

Uruguay Round Agreements. (1994). ***Agreement on subsidies and countervailing measures.*** Article 1.

World Bank. (2016). World Bank Open Data. Retrieved August 10, 2016, from http:/data.worldbank.org

Appendix 1. Calculation of subsidies using the price-gap method

Benzene	2011	2012	2013	2014	2015	Average (2011-2015)	Notes
	Supply cost per litre (AUD)						
International price	$0.71	$0.73	$0.76	$0.75	$0.56	$0.70	1
International transport margin	$0.25	$0.23	$0.22	$0.22	$0.23	$0.23	2
Distribution margin	$0.23	$0.26	$0.23	$0.24	$0.24	$0.24	3
Wholesale expenditure	$0.16	$0.18	$0.16	$0.17	$0.17	$0.17	4
Wholesale return on investment (@13%)	$0.07	$0.08	$0.07	$0.07	$0.07	$0.07	5
Pre-tax wholesale price	$1.20	$1.22	$1.22	$1.22	$1.03	$1.18	6
Retail margin (margin allowed by set prices)	$0.12	$0.11	$0.11	$0.11	$0.11	$0.11	7
Pre-tax retail price	$1.31	$1.33	$1.33	$1.33	$1.14	$1.29	8
Corrective taxes (excise)	$0.17	$0.17	$0.18	$0.19	$0.23	$0.19	9
Greenhouse gas emissions	$0.08	$0.08	$0.08	$0.09	$0.11	$0.09	10
Local air pollution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	11
Congestion	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	12
Accidents	$0.07	$0.07	$0.08	$0.08	$0.10	$0.08	13
Road damage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	14
Value added tax (@12.5%)	$0.18	$0.19	$0.19	$0.19	$0.17	$0.18	15
Post-tax retail price	$1.66	$1.69	$1.70	$1.72	$1.55	$1.66	16
	Actual price per litre (mean, AUD)						17
Pre-tax wholesale price	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03	
Post-tax wholesale price	$1.10	$1.10	$1.10	$1.10	$1.10	$1.10	
Post-tax wholesale price PUB							18
Pre-tax retail price	$1.15	$1.15	$1.14	$1.15	$1.15	$1.15	
Post-tax retail price	$1.22	$1.22	$1.21	$1.22	$1.22	$1.22	
	Subsidy per litre, price-gap method (AUD)						19
Pre-tax, wholesale price	$0.16	$0.19	$0.19	$0.19	$0.00	$0.14	
Pre-tax, retail price	$0.16	$0.19	$0.19	$0.19	$0.00	$0.14	
Post-tax, retail price	$0.44	$0.47	$0.49	$0.50	$0.33	$0.45	
Post-tax, PUB wholesale price							
	Total subsidy, price-gap method (AUD)						20
Total consumption (litres)	5,810,285	6,252,314	7,651,294	6,788,168	7,364,037	6,773,220	21
PUB consumption (litres)							22
Total pre-tax subsidy, at wholesale price (AUD)	$945,261	$1,159,920	$1,444,955	$1,277,668	-$4,383	$964,684	
Total post-tax subsidy, at retail price (AUD)	$2,584,254	$2,940,366	$3,742,576	$3,412,326	$2,464,664	$3,028,837	

Diesel	2011	2012	2013	2014	2015	Average (2011–2015)	Notes
	Supply cost per litre (AUD)						
International price	$0.76	$0.78	$0.81	$0.79	$0.54	$0.74	1
International transport margin	$0.25	$0.22	$0.22	$0.22	$0.23	$0.23	2
Distribution margin	$0.23	$0.26	$0.23	$0.24	$0.24	$0.24	3
Wholesale expenditure	$0.16	$0.18	$0.16	$0.17	$0.17	$0.17	4
Wholesale return on investment (@13%)	$0.07	$0.08	$0.07	$0.07	$0.07	$0.07	5
Pre-tax wholesale price	$1.24	$1.26	$1.26	$1.25	$1.01	$1.20	6
Retail margin (margin allowed by set prices)	$0.07	$0.07	$0.07	$0.07	$0.12	$0.08	7
Pre-tax retail price	$1.32	$1.33	$1.33	$1.32	$1.13	$1.29	8
–							
Corrective taxes (excise)	$0.16	$0.16	$0.17	$0.18	$0.22	$0.18	9
Greenhouse gas emissions	$0.09	$0.09	$0.09	$0.10	$0.12	$0.10	10
Local air pollution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	11
Congestion	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	12
Accidents	$0.04	$0.04	$0.04	$0.05	$0.05	$0.04	13
Road damage	$0.01	$0.01	$0.02	$0.02	$0.02	$0.02	14
Value added tax (@12.5%)	$0.18	$0.19	$0.19	$0.19	$0.17	$0.18	15
Post-tax retail price	$1.66	$1.67	$1.69	$1.69	$1.52	$1.64	16
	Actual price per litre (mean, AUD)						17
Pre-tax wholesale price	$1.31	$1.30	$1.30	$1.30	$1.30	$1.30	
Post-tax wholesale price	$1.37	$1.36	$1.36	$1.36	$1.36	$1.36	
Post-tax wholesale price PUB	$1.27	$1.27	$1.27	$1.27	$1.27	$1.27	18
Pre-tax retail price	$1.38	$1.38	$1.37	$1.38	$1.43	$1.39	
Post-tax retail price	$1.44	$1.44	$1.43	$1.44	$1.49	$1.45	
	Subsidy per litre, price-gap method (AUD)						19
Pre-tax, wholesale price	–$0.06	–$0.04	–$0.04	–$0.06	–$0.29	–$0.10	
Pre-tax, retail price	–$0.06	–$0.04	–$0.04	–$0.06	–$0.29	–$0.10	
Post-tax, retail price	$0.22	$0.24	$0.26	$0.25	$0.03	$0.20	
Post-tax, PUB wholesale price	$0.23	$0.24	$0.25	$0.24	$0.00	**$0.19**	
	Total subsidy, price-gap method (AUD)						20
Total consumption (litres)	12,797,993	12,648,621	14,471,091	13,294,095	14,140,895	13,470,539	21
PUB consumption (litres)	5,896,972	4,902,596	6,365,000	6,108,000	6,005,000	5,855,514	22
Total pre-tax subsidy, at wholesale price (AUD)	–$796,643	–$564,250	–$563,796	–$764,974	–$4,130,706	–$1,364,074	
Total post-tax subsidy, at retail price (AUD)	$2,841,135	$3,033,140	$3,698,558	$3,288,780	$290,966	$2,630,516	

Kerosene	2011	2012	2013	2014	2015	Average (2011–2015)	Notes
	Supply cost per litre (AUD)						
International price	$0.76	$0.77	$0.81	$0.79	$0.54	$0.73	1
International transport margin	$0.25	$0.22	$0.22	$0.22	$0.23	$0.23	2
Distribution margin	$0.23	$0.26	$0.23	$0.24	$0.24	$0.24	3
Wholesale expenditure	$0.16	$0.18	$0.16	$0.17	$0.17	$0.17	4
Wholesale return on investment (@13%)	$0.07	$0.08	$0.07	$0.07	$0.07	$0.07	5
Pre-tax wholesale price	$1.24	$1.25	$1.26	$1.25	$1.02	$1.20	6
Retail margin (margin allowed by set prices)	$0.10	$0.10	$0.10	$0.10	$0.10	$0.10	7
Pre-tax retail price	$1.35	$1.35	$1.36	$1.35	$1.12	$1.31	8
Corrective taxes (excise)	$0.09	$0.09	$0.10	$0.11	$0.13	$0.10	9
Greenhouse gas emissions	$0.09	$0.09	$0.09	$0.10	$0.12	$0.10	10
Local air pollution	$0.01	$0.01	$0.01	$0.01	$0.01	$0.01	11
Congestion	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	12
Accidents	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	13
Road damage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	14
Value added tax (@12.5%)	$0.18	$0.18	$0.18	$0.18	$0.16	$0.18	15
Post-tax retail price	$1.62	$1.63	$1.64	$1.64	$1.40	$1.58	16
	Actual price per litre (mean, AUD)						17
Pre-tax wholesale price	$0.88	$0.88	$0.87	$0.88	$0.88	$0.88	
Post-tax wholesale price	$0.88	$0.88	$0.87	$0.88	$0.88	$0.88	
Post-tax wholesale price PUB							18
Pre-tax retail price	$0.98	$0.98	$0.98	$0.98	$0.98	$0.98	
Post-tax retail price	$0.98	$0.98	$0.98	$0.98	$0.98	$0.98	
	Subsidy per litre, price-gap method (AUD)						19
Pre-tax, wholesale price	$0.36	$0.37	$0.38	$0.37	$0.14	$0.33	
Pre-tax, retail price	$0.36	$0.37	$0.38	$0.37	$0.14	$0.33	
Post-tax, retail price	$0.64	$0.65	$0.67	$0.65	$0.42	$0.60	
Post-tax, PUB wholesale price							
	Total subsidy, price-gap method (AUD)						20
Total consumption (litres)	2,471,499	2,256,126	2,294,220	2,130,589	2,207,418	2,271,970	21
PUB consumption (litres)							22
Total pre-tax subsidy, at wholesale price (AUD)	$898,614	$842,787	$880,017	$782,319	$304,632	$741,674	
Total post-tax subsidy, at retail price (AUD)	$1,569,689	$1,457,354	$1,526,178	$1,395,216	$929,977	$1,375,683	

Summary	2015			Average (2011–2015)		
	Benzene	Diesel	Kerosene	Benzene	Diesel	Kerosene
	Supply cost per litre (AUD)					
Pre-tax wholesale price	$1.03	$1.01	$1.02	$1.18	$1.20	$1.20
Pre-tax retail price	$1.14	$1.13	$1.12	$1.29	$1.29	$1.31
Post-tax retail price	$1.55	$1.52	$1.40	$1.66	$1.64	$1.58
	Actual price per litre (mean, AUD)					
Pre-tax wholesale price	$1.03	$1.30	$0.88	$1.03	$1.30	$0.88
Post-tax wholesale price	$1.10	$1.36	$0.88	$1.10	$1.36	$0.88
Post-tax wholesale price PUB		$1.27			$1.27	
Pre-tax retail price	$1.15	$1.43	$0.98	$1.15	$1.39	$0.98
Post-tax retail price	$1.22	$1.49	$0.98	$1.22	$1.45	$0.98
	Subsidy per litre, price-gap method (AUD)					
Pre-tax, wholesale price	$0.00	-$0.29	$0.14	$0.14	-$0.10	$0.33
Pre-tax, retail price	$0.00	-$0.29	$0.14	$0.14	-$0.10	$0.33
Post-tax, retail price	$0.33	$0.03	$0.42	$0.45	$0.20	$0.60
Post-tax, PUB wholesale price		$0.00			$0.19	
	Total subsidy, price-gap method (AUD)					
Total consumption (litres)	7,364,037	14,140,895	2,207,418	6,773,220	13,470,539	2,271,970
PUB consumption (litres)		6,005,000			5,855,514	
Total pre-tax subsidy, at wholesale price (AUD)	–$4,383	–$4,130,706	$304,632	$964,684	–$1,364,074	$741,674
Total post-tax subsidy, at retail price (AUD)	$2,464,664	$290,966	$929,977	$3,028,837	$2,630,516	$1,375,683

Notes

1. International price

This field is the annual average price calculated from Platts World Monthly Average prices: Platts ULP 92 RON for benzene, Platts diesel 500 ppm for diesel, and Platts jet fuel/kerosene for kerosene.

2. International transport margin

The international transport margin means the difference between cost, insurance, freight (CIF) and free on board (FOB) prices. It has been estimated by using KOIL price template data and Worldscale freight rates. The price used is a weighted average (by volume sold) for the estimated margin for Kiritimati and Tarawa. An alternative way to estimate the transport margin would be to use cost-of-sales figures from KOIL accounts for each type of fuel and

divide them by corresponding volumes imported. The transport margin is then this figure less the international price. In principle, the latter method is more accurate since it is based on real, instead of estimated data. However, cost-of-sales data were only available for 2011–2013 and thus the template estimates were used for all years instead. Estimates based on the template figures also result in more conservative estimates. When using the cost-of-sales figures to estimate the subsidies from 2011 to 2013, on average the total for benzene is 13 per cent higher and diesel 14 per cent higher than the estimates based on the template approach (see Figure A1-1). For kerosene, on the other hand, the subsidies are 8 per cent lower. While the difference between the two sets of estimates is significant, particularly for 2012, the general conclusions and recommendations in this report would be the same for both.

Figure A1-1. Comparison of subsidy estimates between the template and cost-of-sales methods.

3. Distribution margin

Distribution margin is defined as:

$$Wholesale\ expenditure + wholesale\ return\ on\ investment$$

For simplicity, freight costs to outer islands are excluded from the estimation. Since freight costs to outer islands are subsidised by the government, this results in an underestimation of the total subsidy. The freight subsidy to outer islands has been already analysed by CIE (2012).

4. Wholesale expenditure

Wholesale expenditure has been estimated based on KOIL's financial statements as:

$$Operating\ expenditure - cost\ of\ sales - doubtful\ debts - debts\ written\ off$$

This figure is then divided by the total volume of all fuel sales by KOIL in litres to come up with a wholesale expenditure per litre figure. It is the same for all fuels. For 2014 and 2015 the average of period 2011–2013 has been used due to lack of KOIL financial data.

5. Wholesale return on investment

KOIL has been allowed a return on investment at 13 per cent. Return on investment has been calculated as:

$$\frac{Operating\ profit\ for\ the\ year + interest}{\frac{1}{2}\times(Total\ equity_a + total\ liabilities_a - interest\ free\ loans_a + Total\ equity_{a-1} + total\ liabilities_{a-1} - interest\ free\ loans_{a-1})}$$

Where ***a*** is the closing date of the accounting year (expressed in years). The figure in the table is return on investment in AUD allowed after interest paid per litre of fuel sold. Interest payments have been accounted for in wholesale expenditure already. For 2014 and 2015 the average of period 2011–2013 has been used due to lack of KOIL financial data.

6. Pre-tax wholesale price

Calculated as:

$$International\ price + international\ transport\ margin + distribution\ margin$$

7. Retail margin

Due to lack of data for better estimates, the retail margin has been estimated as the difference between actual retail and wholesale prices. Thus any subsidy element that has been incorporated into the retail margin is not captured in the analysis. Since both wholesale and retail prices for benzene and kerosene are controlled, it is possibly that the retail margin does not represent the cost-recovery prices and this creates an underestimation (or overestimation in case the margin is set too high) of consumer subsidies.

8. Pre-tax retail price

Calculated as:

$$Pre-tax\ wholesale\ price + retail\ margin$$

9. Corrective taxes

Calculated as the sum of the components of corrective tax:

$$Greenhouse\ gas\ emissions + local\ air\ pollution + congestion + accidents + road\ damage$$

10. Greenhouse gas emissions

This is the estimated corrective tax to compensate for the cost of greenhouse gas emissions from consuming the fuels. For benzene and diesel, the IMF (2014) estimate for Kiribati is used. The value for kerosene has been estimated based on the emission factors according to 2006 IPCC Guidelines for National Greenhouse Gas Emissions (IPCC, 2006).

11. Local air pollution

This is the estimated cost of local air pollution as a result of consuming the fuels, mainly in the form of adverse health effects. For benzene and diesel, the IMF (2014) estimate for Kiribati is used. For kerosene a reference value from UNEP's research in Kenya has been used (UNEP, 2016).

12. Congestion

This refers to the cost of traffic congestion resulting from the consumption of fossil fuels on road vehicles. For benzene and diesel, the IMF (2014) estimate for Kiribati is used. Kerosene has no costs of this kind.

13. Accidents

This refers to the cost of road accidents as a result of consumption of fossil fuels on road vehicles. For benzene and diesel, the IMF (2014) estimate for Kiribati is used, while kerosene has no costs of this kind.

14. Road damage

This refers to the cost of road damage as a result of consumption of fossil fuels on road vehicles. For benzene and diesel, the IMF (2014) estimate for Kiribati is used, while kerosene has no costs of this kind.

15. Value added tax

A 12.5 per cent value added tax has been applied to all fuels. The justification for this is that a uniform tax eliminates allocative distortions causing inefficiency in the economy, and thus any VAT exemptions should be considered a subsidy. VAT has been applied to all years, even though it was adopted in April 2014, in order to analyse the impact of the current tax regime. VAT has been applied after corrective tax.

16. Post-tax retail price

Calculated as:

$$Pre\ tax\ retail\ price + corrective\ taxes + value\ added\ tax$$

17. Actual price per litre

The actual price has been calculated as the weighted average (by volume sold) of actual prices in the Gilbert, Line and Phoenix Islands.

18. Wholesale price PUB

The price at which KOIL supplies diesel to PUB.

19. Subsidy per litre, price-gap method

Calculated as the difference between cost-recovery pre-tax wholesale price, pre-tax retail price, and post-tax wholesale price, and the corresponding actual price. For PUB, however, the congestion, accidents and road damage have been deducted from the cost-recovery price, since these costs are not relevant to electricity production. The corresponding VAT has been adjusted to reflect this as well.

20. Total subsidy, price-gap method

Calculated as:

$$Subsidy\ per\ litre \times volume\ consumed$$

For diesel, the PUB price has been used for the volume sold to PUB.

21. Total consumption

Based on KOIL sales figures, the kerosene volume for non-aviation consumption in the Line and Phoenix Islands was estimated, assuming the same proportions of aviation and non-aviation use as in the Gilbert Islands.

22. PUB consumption

The amount of fuel sold to PUB for electricity consumption. Based on KOIL sales figures.

Pacific Community
Communauté du Pacifique

Contact details:
Pacific Community
Private Mail Bag
Suva, Fiji
Phone: +679 3370733
Fax: +679 3370146
Email: edd@spc.int
Website: www.spc.int/edd