



# GREEN *economy*

Fiscal Policy Analysis



# Kenya





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# CONTENTS

iv	List of tables
iv	List of figures
iv	List of boxes
iv	List of acronyms and abbreviations
v	<b>Acknowledgements</b>
1	<b>Executive summary</b>
3	<b>1 Introduction</b>
5	<b>2 The overall fiscal framework</b>
5	2.1. Expenditure
6	2.2. Revenue
7	2.3. The overall fiscal balance
8	2.4. Decentralization in Kenya
11	2.5. Consolidated general government
13	<b>3 Channeling oil revenue for green growth</b>
13	3.1. Exploration and exploitation perspectives and the legal and fiscal framework
13	3.2. Production
13	3.3. Legal and fiscal framework
15	3.4. Expected revenues in the oil sector
15	3.5. Allocation of oil revenue and ensuring revenue discipline
15	3.6. Estimating the size of oil revenues
16	3.7. Options for the use of oil revenues
16	3.8. Intergovernmental sharing
19	3.9. Sovereign Funds for green investments
21	3.10. Stabilization Fund
22	3.11. Direct cash transfers
25	3.12. Constraints on use of funds including creation of sector funds
27	<b>4 Taxation of fuels</b>
27	4.1. Background
28	4.2. A corrective tax on transport and residential fuels
29	4.3. Reform scenarios
31	4.4. Corrective tax on transport fuels: Distributive impact of reform and its compensation
34	4.5. Residential uses: A corrective tax on kerosene
36	4.6. Reform scenarios: Impact on consumption, pollution and revenue
41	<b>5 Conclusion</b>
43	<b>6 Annexes</b>
43	Annex 1. Externalities deriving from the production and consumption of petroleum products
44	Annex 2. Taxation components on diesel and gasoline
44	Annex 3. Determination of emissions content from use of kerosene
45	Annex 4. Property taxation in a representative group of countries
47	<b>References</b>
50	<b>Notes</b>

## LIST OF TABLES

- Table 1. Central government expenditure as a percentage of GDP. Kenya compared with Ghana, Mauritius and sub-Saharan Africa (2012-2019)
- Table 2. Central government expenditure by sector and as a percentage of GDP in a sample of sub-Saharan countries (2012)
- Table 3. Structure of government revenue as a percentage of GDP in a sample of sub-Saharan countries, (2012)
- Table 4. Tax revenue as a share of GDP
- Table 5. Tax rates applicable to personal income tax and social security contributions in Ghana, Mauritius and Kenya
- Table 6. Overall central government budget balance as a percentage of GDP. Kenya compared to Ghana, Mauritius and sub-Saharan Africa (2012-2018)
- Table 7. Public debt as a percentage of GDP
- Table 8. General government consolidated budget operations
- Table 9. Estimates of production and government take with alternative price and reserve assumptions
- Table 10. International practice in constraining use of natural resource revenue
- Table 11. Burden of taxes on transport fuels
- Table 12. Size of full corrective taxes internalizing the global and local externalities of transport fuels
- Table 13. Proposed levels of corrective tax on transport fuels according to the three scenarios
- Table 14. Impact on consumption and revenue collections of fuel reform
- Table 15. Cost of compensation for transport fuels according to the four schemes
- Table 16. Taxation of kerosene for domestic uses
- Table 17. Corrective tax internalizing global and local externalities of kerosene for domestic uses
- Table 18. Environmentally efficient tax on kerosene: simulation of reforms internalizing environmental externalities partially and fully
- Table 19. Per capita kerosene expenditure and consumption by quintile (2013)
- Table 20. Mean annual per capita kerosene expenditures per quintile before and after tax changes
- Table 21. Cost of compensation schemes for kerosene according to the four schemes
- Table 22. Emissions parameters used for kerosene corrective tax calculations
- Table 23. Collections from property tax as a share of GDP by groups of countries (per cent)

## LIST OF FIGURES

- Figure 1. Devolution of responsibilities to counties
- Figure 2. Financing the responsibilities of the counties
- Figure 3. Household energy consumption, by product and percentage on total expenditure for energy (2013)
- Figure 4. Share of transport fuel expenditure on total household consumption expenditure per quintiles before and after reform (2013)
- Figure 5. Estimate of share of kerosene expenditure on total household consumption expenditure per quintiles (2013)

## LIST OF BOXES

- Box 1. Norway's Sovereign Wealth Fund
- Box 2. Some country experiences with Stabilization Funds
- Box 3. Instruments for compensating poor households

## LIST OF ACRONYMS AND ABBREVIATIONS

AfDB	African Development Bank
CBR	Constitutional Budget Reserve of Alaska
CIF	Cost, Insurance, Freight
EEA	European Environment Agency
EFR	Environmental Fiscal Reform
EIA	Energy Information Administration
EIT	Emission Inventory Guidebook
EITI	Extractive Industries Transparency Initiative
EMEP	European Monitoring and Evaluation Programme
ERC	Energy Regulatory Commission
ESPA	Ecosystem Services for Poverty Alleviation
GAINS	Greenhouse Gas and Air Pollution Interactions and Synergies
GDP	Gross Domestic Product
GFSY	Government Finance Statistics Yearbook
GPF	Government Pension Fund Global (Norway)
GPOBA	Global Partnership on Output-Based Aid
GSF	Green Sovereign Fund
IDA	International Development Association
IIASA	International Institute for Applied Systems Analysis
IIED	International Institute for Environment and Development
IMF	International Monetary Fund
KSh	Kenyan shilling
KHBS	Kenya Household Budget Survey
KIPPRA	Kenya Institute for Public Policy Research and Analysis
LPG	Liquefied petroleum gas
NCCFP	National Climate Change Framework Policy
NGO	Nongovernmental organization
NRR	National Resource Revenue
PI	Permanent Income
PIEA	Petroleum Institute of East Africa
PIH	Permanent Income Hypothesis
PPP	Public Private Partnership
SREP	Scaling-Up Renewable Energy Programme
SWF	Sovereign Wealth Fund
UNEP	United Nations Environment Programme
USD	United States dollar
VAT	Value Added Tax

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## EXECUTIVE SUMMARY

Investment in energy programmes and enhanced environmental infrastructure are among the key priorities for a green economy transition in Kenya. According to estimates, green economy investments required across different sectors represent about 9 per cent of total public sector expenditure, among which the energy sector accounts for the majority of investment needs. There is a particular need to finance programmes to develop geo-thermal, wind and solar energy sources and substitute the use of polluting energy inputs (such as charcoal, wood and kerosene) with less environmentally damaging alternatives. There is also a need for costly investments in other areas, for example to address gaps in access to basic services, such as water and sanitation.

Financing these investments is a significant budgetary challenge given the stringency of the public sector's financial situation. High public expenditure and relatively low revenue generation has resulted in a public sector imbalance of about 5 per cent of GDP. This requires substantial effort to avoid uncontrolled increases over time. In view of this budgetary context, new tax revenues and other sources of financing are needed to support energy programmes and other green economy investments.

In addition, Kenya recently embarked on an ambitious process of administrative and fiscal decentralization. This process has an impact on environmental policies as the provision of basic environmental services and infrastructure is now devolved to newly created subnational government structures known as "counties". Tax revenue at the central and subnational<sup>1</sup> level will also need to be expanded to finance this process.

This study examines the overall fiscal framework in place, including at the county level, and analyses the existing fiscal space for financing green economy investments in Kenya. Projections of the general government budget show that the incidence of total public expenditure as a share of GDP will remain unchanged in the coming years. This study examines how additional fiscal space can be created to finance

green investments through the use of future revenues from oil and gas exploitation and reforming taxes on energy products, which will also help to internalize negative environmental externalities in the price of fossil fuels.

According to estimates in the study, if projected oil reserves are confirmed, upstream revenue from oil production could amount to between 6 and 10 per cent of current central government revenue. This could provide a potential source of financing for green economy related investments. There are however competing claims on these revenues. Moreover, a persistent decline in the international oil price will lead to lower revenue estimates. The reform of the legal and fiscal framework for oil and gas exploration that are currently under consideration in Parliament provides an opportunity to evaluate options for the use of revenues from the sector.

Two options in the current legal discipline are the creation of a Sovereign Wealth Fund (SWF) and a system of intergovernmental sharing to benefit subnational governments in oil-producing areas. This study questions the viability of the SWF as much higher annual deposits than the currently mandated minimum of 5 per cent of oil revenue are needed when taking into account administration costs. This study also suggests a revision to the system of intergovernmental sharing such that the allocation of oil revenues to oil-producing areas is based on remunerating costs for providing oil-related infrastructure and services, as well as for compensating any related environmental damages from oil production.

In addition, the study considers three further options for the use of revenues from the oil sector, namely, a Stabilization Fund for government revenue; direct cash transfers to individuals; and a special fund for environmental projects and related investments. The Stabilization Fund is strongly recommended given that oil revenue levels are likely to fluctuate. Direct cash transfers are a radical alternative which could be considered in the event that the oil revenues are high, misspent or lead to flagrant cases

of corruption. By reorienting (and relabelling the SWF) into a special fund for environmental projects (Green Sovereign Fund), natural resource revenues could be channelled to specific purposes, such as environmental protection, technology, or green growth investment. This special fund would align the use of oil revenue with important national priorities which may otherwise be difficult to achieve.

The study also explores the potential reform of energy taxes initially focused on gasoline, diesel and kerosene. A tax correcting for global and local damages produced by fossil fuels used for transportation would provide an additional 0.5 percentage points of collections on GDP, representing an increase of about 28 per cent

over revenues in 2013 (almost 2 per cent of GDP). Reforming kerosene taxation to fully internalize environmental and health damages would provide about 0.08 per cent of GDP, representing a substantial increase in the current level of taxation (0.01 per cent of GDP). Revenue from reformed kerosene taxation could provide resources for the much-needed switch to cleaner, more efficient lighting and cooking devices.

The suggested reforms to fiscal policies in the energy and transport sector outlined in this study could expand fiscal space and help to mobilize additional resources for green economy investments, thus providing crucial steps in Kenya's overall green economy strategy.



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# 1 INTRODUCTION

According to the *Green Economy Assessment Report* on Kenya (UNEP, 2014) investment in energy programmes and enhanced environmental infrastructure are among the key priorities for a green economy transition in Kenya. Estimated green economy investment needs across different sectors amount to KSh 135 billion, (US\$1.57 billion)<sup>2</sup>, representing about 9 per cent of public sector expenditure in Kenya (see Table 8).

In the energy sector, there is a need to finance costly programmes for developing geo-thermal, wind and solar energy sources, and for substituting the use of energy inputs with high impacts on local pollution, such as charcoal, wood and kerosene, with less environmentally damaging alternatives. Electricity and liquefied gas are the main options mentioned in official documents (Republic of Kenya Ministry of Energy and Petroleum, 2014). This substitution requires significant investment in the whole production and distribution chain, from hydroelectric power plants, to the extension of the national grid, bulk storage and filling stations.

Financing these investments is a significant budgetary challenge given the stringency of the public sector's financial situation. Kenya has a rather high level of public expenditure with relatively low revenue generation, which results in a public sector imbalance of about 5 per cent of GDP. Substantial commitment and effort is needed to avoid uncontrolled increases over time (IMF, 2014; Kenya National Treasury, 2014).

In view of this budgetary context, financing energy programmes and enhanced environmental expenditure requires efforts to raise new tax revenues, particularly at the central level. This could be done by improving the administration of major taxes, particularly VAT. Reformed energy taxes can also generate a non-negligible amount of additional revenues, particularly through remodulation, which can be used to finance green economy investments, while also helping to internalize negative environmental externalities.

Kenya has recently embarked on an ambitious process of administrative and fiscal decentralization.

This process is quite relevant from the point of view of environmental policies, since the provision of basic environmental services and infrastructure has been devolved to 47 new counties (which amalgamate previous responsibilities of local authorities, deconcentrated administrations and district administrations). Decentralization is a costly process for national finances, particularly as the Kenyan constitution stipulates that at least 15 per cent of national revenue should be devolved to the counties. In this regard, an effort to expand tax revenue is also needed at the subnational level, particularly by restructuring the property tax that currently plays a minor role in the financing of local expenditure. Changes to the property tax can help to: (a) raise additional revenue; (b) provide incentives to subnational governments by strengthening the link between the services provided and the tax levied; and (c) facilitate local access to credit for green investments by providing collateral for loans.

Future revenues from oil exploitation are another important potential source of financing for green economy related investments. The reform of the legal and fiscal framework for oil and gas exploration and exploitation is still under consideration in Parliament. This provides an opportunity for options to be considered for the use of revenues from oil exploitation.

In view of the above, this study examines the overall fiscal framework in place, including at the county level, with the aim of analysing the existing fiscal space for financing green economy investments. Projections of the general government budget show that the incidence of total public expenditure as a share of GDP will remain unchanged in the coming years. The study examines how additional fiscal space can be created to finance green investments through revenues generated from oil exploitation. The analysis includes an estimation of the potential revenue generated from oil and gas extraction and the opportunity to use this revenue to support green investments. Finally, the study explores the potential for additional revenue generation from a reform of energy taxes, including a remodulation of current levies and taxes and an increase in property taxes.



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## 2 THE OVERALL FISCAL FRAMEWORK

### 2.1. EXPENDITURE

As can be seen in Table 1, central government expenditure absorbs about one-fourth of GDP. This share steadily increased between 2012 and 2014, and the central government intends to maintain this expenditure at the current level (IMF, 2014; Kenya National Treasury, 2014).

Adding subnational expenditure to that of the central government does not alter the numbers substantially, as subnational expenditure is mostly financed by

central government grants (as illustrated below and reported in Table 8). As a matter of fact, until 2012 Kenya had a rather centralized system of governance, with almost no local expenditure. As a consequence the allocation of central government spending by sectors (as can be seen in Table 2), is illustrative of total general government spending, as classified in international statistics.

The major areas of spending, in addition to general administration, are in economic affairs and education. Environmental protection includes the provision of

**TABLE 1. CENTRAL GOVERNMENT EXPENDITURE AS A PERCENTAGE OF GDP. KENYA COMPARED WITH GHANA, MAURITIUS AND SUB-SAHARAN AFRICA (2012-2019)**

	2012*	2013*	2014	2015	2016	2017	2018	2019
Ghana	30.7	26.7	26.3	25.7	26.2	27.6	27.5	24.5
Kenya	24.2	25.4	26.5	26.7	26.3	26.0	25.6	25.3
Mauritius	23.3	24.9	24.5	24.4	24.2	23.9	24.2	23.9
Sub-Saharan Africa	25.1	24.5	24.2	24.0	23.6	23.4	23.2	23.1

\* 2012 and 2013: actual; other years: projections.

Source: IMF (2014a), most recent editions for the concerned countries

**TABLE 2. CENTRAL GOVERNMENT EXPENDITURE BY SECTOR AND AS A PERCENTAGE OF GDP IN A SAMPLE OF SUB-SAHARAN COUNTRIES (2012)**

	General Public Services	Defence	Public Order and Safety	Economic Affairs	Environmental Protection	Housing and Community Amenities	Health	Recreation, Culture, and Religion	Education	Social Protection
Côte d'Ivoire	8.1	1.0	0.9	1.6	0.3	2.6	1.3	0.3	5.2	0.4
Angola	7.6	4.0	3.6	4.3	0.5	1.5	1.9	0.6	3.3	6.3
Cape Verde*	9.2	0.8	2.4	8.6	0.5	0.3	2.3	0.4	5.5	3.0
Kenya	9.4	1.8	2.3	6.8	0.3	0.7	1.6	0.1	5.6	1.1
Liberia	10.2	...	...	4.0	...	...	2.8	...	4.1	...
Madagascar*	3.7	0.7	1.4	0.5	0.0	–	0.7	0.1	2.6	0.0
Mauritius	6.3	–	2.2	2.8	0.8	0.8	2.3	0.2	3.4	5.7
Namibia*	6.6	3.9	3.6	8.5	1.1	1.7	4.0	0.6	10.1	2.1
Seychelles	11.4	1.0	2.5	1.9	2.2	0.8	3.7	0.8	4.3	4.5
South Africa	16.0	1.2	3.1	2.9	0.1	1.6	1.0	0.1	1.5	3.7
Uganda	4.5	2.6	1.4	5.7	0.1	0.5	1.6	0.0	2.8	1.1

\* Indicates a previous year

Source: IMF, Government Finance Statistics Yearbook (GFSY).

basic services, such as water and sanitation, and absorbs just 0.3 per cent of GDP (see Table 2). In most respects, the allocation of expenditure in Kenya is broadly similar to those of other sub-Saharan countries, with the exception of South Africa and Uganda, where decentralization of health, education, environment and recreation explains the low share of central government expenditure in these sectors. Environmental expenditure is low in Kenya. In addition to South Africa and Uganda, where this expenditure is decentralized, only Madagascar, has a lower share allocated to environmental expenditure.

## 2.2. REVENUE

In the year 2012, tax revenues represented a modest 19.7 per cent of GDP, which falls below the average of other sub-Saharan countries (Table 3).

The structure of revenues in Kenya is not dissimilar from that of other African countries, as reported in Table 3. Most tax revenue derives from taxes on

income and sales. Taxes on international trade are modest and property taxes are non-existent in terms of their revenue generation.

Weaknesses in tax administration and collection have a negative impact on the volume of tax collections in Kenya. With an ordinary tax rate of 16 per cent, VAT generates collections that are lower than 5 per cent of GDP (Table 4), implying a tax efficiency of 31 per cent, which is comparatively low. This is explained by various exemptions and low levels of tax compliance. The Government of Kenya is currently implementing a new VAT law and other changes to improve tax collections.<sup>3</sup>

The overall burden of taxation on labour is relatively moderate and aligned with that of Ghana and Mauritius, with a higher marginal tax rate for income tax and lower social security contributions (Table 5). This burden may exert a negative impact on the growth of the formal sector. However, reducing the burden on labour is problematic in view of fiscal stringency.

**TABLE 3. STRUCTURE OF GOVERNMENT REVENUE AS A PERCENTAGE OF GDP IN A SAMPLE OF SUB-SAHARAN COUNTRIES (2012)**

	Taxes							Social Contributions	Grants	Other Revenue	Total revenue
	Income, Profits, and Capital Gains	Payroll and Workforce	Property	Goods and Services**	International Trade and Transactions	Other Taxes	Total taxes				
Côte d'Ivoire	3.9	–	0.1	4.4	7.2	–	15.6	–	0.6	2.2	18.5
Angola	12.9	–	0.1	3.6	1.4	0.9	18.9	1.0	–	20.4	40.3
Cape Verde	5.1	–	–	8.6	3.5	–	17.2	0.0	1.8	2.9	21.8
Ghana*	5.3	–	–	5.9	3.6	–	14.9	0.1	2.3	4.4	21.6
Kenya	9.1	–	0.0	7.6	2.2	0.7	19.7	0.0	0.4	2.1	22.2
Liberia	7.3	–	0.1	3.5	8.8	1.1	20.9	0.1	1.6	3.8	26.5
Madagascar*	2.6	–	0.1	2.4	5.0	0.0	10.1	–	1.9	0.2	12.2
Mauritius	4.4	–	1.4	13.0	0.5	0.4	19.6	0.7	0.7	1.6	22.6
South Africa	14.3	0.4	0.3	9.3	1.2	0.0	25.4	–	0.1	0.5	26.0
Uganda	5.3	–	–	7.8	1.4	0.1	14.6	–	2.5	0.2	17.4
Zambia*	11.4	–	–	3.9	2.9	–	18.2	–	4.0	1.5	23.8

\* Indicates a previous year \*\*Includes present excises on oil  
Sources: IMF (2014a), most recent editions for the concerned countries.

**TABLE 4. TAX REVENUE AS A SHARE OF GDP IN KENYA**

	Actual	Preliminary	Estimated
	2011/2012	2012/2013	2013/2014
Tax revenue	19.3	15.6	16.9
Income tax	9.6	8.3	8.9
Import duty (net)	1.6	1.3	1.3
Excise duty	2.4	1.9	2
Value-added tax	5.7	4.1	4.6
Non-tax revenue	3.8	3.2	2.3

Source: IMF (2014a)

**TABLE 5. TAX RATES APPLICABLE TO PERSONAL INCOME TAX AND SOCIAL SECURITY CONTRIBUTIONS IN GHANA, MAURITIUS AND KENYA**

	Ghana	Mauritius	Kenya
Lowest tax rate on personal income tax	5% on annual income up to US\$ 736	15%	10% on annual income up to US\$ 1,342
Highest (marginal) tax rate on personal income tax	27.5% on annual income over US\$ 9,800	15%	30% on annual income above US\$ 5,134
Social security contributions on employees	5.5%	4%	variable
Social security contributions on employers	13%	10%	10%

Sources: Mauritius: KPMG (2013); Kenya: Kenya Revenue Authority <http://www.kra.go.ke/#> (Domestic Taxes webpage); Ghana: Ghana Revenue Authority <http://www.gra.gov.gh> (Tax Information webpage).

Further resources for green investment will be generated once oil production comes on stream. However, this is dependent on how green investment priorities fare compared to competing claims for the allocation of these resources, as illustrated in section three of this study.

### 2.3. THE OVERALL FISCAL BALANCE

Since 2012, the central government budget has been in deficit of about 5 per cent of GDP, situating Kenya in between Ghana and Mauritius and much above the average for sub-Saharan Africa (Table 6). Projections by the National Treasury and IMF (see Table 6) show a commitment to slowly decrease this deficit over time and stabilize it at below 5 per cent. If accompanied by annual GDP growth rates of the same size, this level of deficit would allow a quasi-stabilization of the level of public debt. This level is actually set at about 42 per cent of GDP and is

projected not to exceed 45 per cent. Some fiscal risks that pose potential problems to maintaining the debt at its present level are set out below:

- A protracted slowdown of economic growth under unfavourable international macro-conditions would worsen the debt dynamics. However, the IMF (2014) and the National Treasury (2014) consider there is a low probability that this will occur.
- The fiscal situation could deteriorate if the government were to decide to increase its expenditure on the basis of expectations of high oil and gas revenues, which may not materialize. However, current projections for the medium-term budget do not take into account the revenues from oil given the uncertainty as to when production will effectively begin.
- Problems could arise from the liabilities accumulated by local authorities before the reform. The magnitude of the existing stock of debt of local authorities has yet to be verified, while the newly formed counties dispute the service of previous debt.

**TABLE 6. OVERALL CENTRAL GOVERNMENT BUDGET BALANCE, AS A PERCENTAGE OF GDP IN KENYA COMPARED TO GHANA, MAURITIUS AND SUB-SAHARAN AFRICA (2012-2019)**

	2012	2013	2014	2015	2016	2017	2018	2019
Ghana	-12.1	-10.0	-7.8	-6.5	-7.4	-5.9	-5.9	-2.5
Kenya	-5.0	-5.7	-6.0	-5.8	-5.3	-4.8	-4.3	-3.9
Mauritius	-1.8	-3.5	-2.8	-3.5	-3.6	-3.3	-3.7	-3.5
Sub-Saharan Africa	-1.8	-3.1	-3.3	-3.3	-3.1	-3.3	-3.3	-3.4

Sources: IMF, Article IV Consultation-Staff Reports, most recent editions for the concerned countries

**TABLE 7. KENYA'S PUBLIC DEBT AS A PERCENTAGE OF GDP**

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
	Actual	Preliminary	Projections				
Total public debt (gross)	42.1	42.2	45.8	45.5	45.4	45	44.3
Of which: external debt	18.8	19.4	19	19.3	19.7	19.7	20.1
Of which: domestic debt (gross)	23.4	22.8	26.8	26.2	25.7	25.2	24.2
Total public debt, net of deposits (percentage of GDP)	37.6	38.2	40.7	41.3	41.4	41.1	40.5

Sources: IMF (2014a), most recent editions for the concerned countries

Risks could also derive from contingent liabilities accumulated by public private partnerships (PPPs), particularly in the energy sector, health, transport and ports. Authorities consider these risks to be substantial.<sup>4</sup>

## 2.4. DECENTRALIZATION IN KENYA

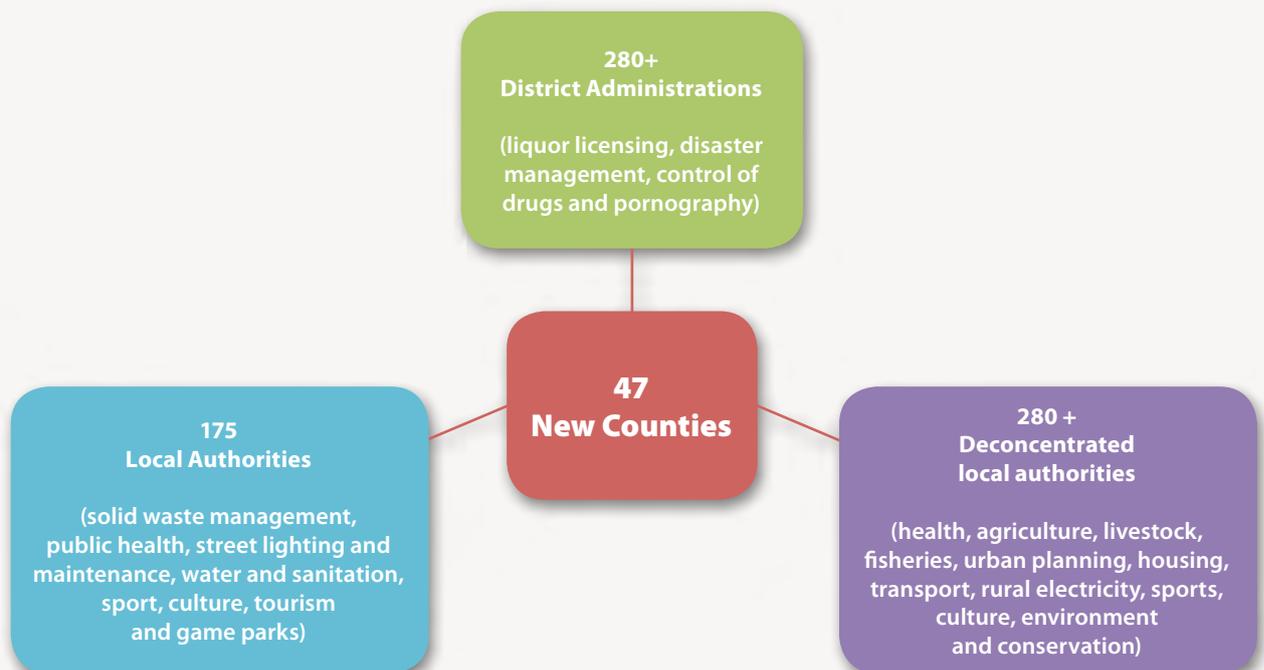
Decentralization in Kenya is a significant challenge as counties (subnational governments) are now mandated to improve service provision in key areas of basic environmental services, education and health. This task not only requires additional resources but also a high level of local capacity, both of which are currently generally missing in Kenya (World Bank, 2012).

There remain significant gaps, particularly in the provision of basic services and health. According to the WHO/UNICEF *Joint Monitoring Programme on Water and Sanitation 2012 Report*,<sup>5</sup> 59 per cent of Kenya's population lack access to improved sanitation, while 32 per cent lack access to safe water supplies. The country has faced significant challenges in water provision in recent years as erratic weather patterns have caused droughts and shortages of clean water. Urban migration

exacerbates the sanitation challenge in densely populated cities experiencing unregulated growth. Low public expenditure on health care and high treatment costs severely curtail access to health care by the poor. Addressing these gaps requires more efficient management of spending and additional resources, which is a challenge for the central government given its commitment to maintain a balanced budget. Successful decentralization has therefore become crucial to maintain macro-financial stability and improve environmental service provision. Under the new constitution, counties have responsibilities for the provision of basic services such as water and sanitation.

Forty-seven new counties were created following the introduction of a new Constitution in 2010 which replace the previous system of provinces and districts (World Bank, 2012). The territorial structure of governance in Kenya is now based on two layers:<sup>6</sup> the central government and the counties (World Bank, 2012; Vasquez, 2013).<sup>7</sup>

Counties have an extremely wide range of competences, having inherited the responsibilities of local authorities and district administrations which have been merged into the counties as illustrated in Figure 1. The counties oversee local

**FIGURE 1. DEVOLUTION OF RESPONSIBILITIES TO THE COUNTIES**

Source: World Bank (2011).

policy implementation and are responsible for the delivery of health care and pre-primary education, public works and transportation. They will also have crucial environmental competences, including the provision of water, sanitation, refuse collection and disposal, public hygiene, as well as protection of the physical environment.

To finance the wide set of competences assigned to them, the new county governments receive a constitutionally guaranteed budget allocation from the central government, known as the Equitable Share, with a minimum total amount of 15 per cent of central government revenue (see Figure 2). The Equitable Share is an unconditional transfer, distributed according to a formula based on population, poverty and a lump sum transfer. In addition, the 14 most impoverished counties will receive limited (0.5 per cent of central government revenue) additional funding through the Equalization Fund, which was created under Article 204 of the new constitution. All counties are also entitled to conditional transfers, particularly for roads and general hospitals.

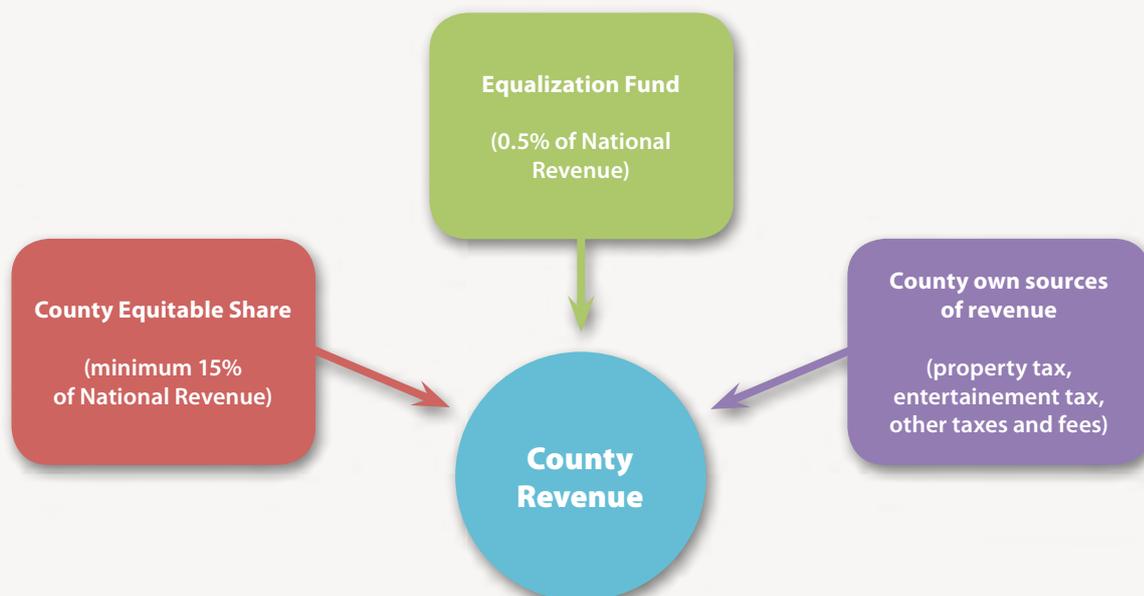
Counties and local governments can generate their own revenues, particularly by levying a property

tax and various fees. Borrowing can also provide resources, when adequately regulated. Presently, new borrowing by counties can only take place with a guarantee by the central government. The National Treasury is in the process of developing guidelines on county borrowing, as well as establishing a database of county financial information to assess the fiscal capacity of counties and their debt sustainability (World Bank, 2011).

The process of devolution has been characterized by a mismatch between the devolution of functions and of finance. For instance, there has been no transfer for the payment of salaries of county employees and transfers for road construction has faced delays – functions still waiting for the devolution of competences (World Bank, 2012). On the other hand, there are fears that conditional grants for some devolved functions, such as the general hospitals located in only five counties, are not large enough to ensure an adequate level of service provision.

The first full-year budget prepared and managed by the counties refers to 2013-2014, although there is still only limited information on how it has been prepared or how it will be implemented. According to the information provided by the Commission on

**FIGURE 2 REVENUE SOURCES OF THE COUNTIES**



Source: Authors' compilation

Revenue Allocation (2014), 26 counties out of a total of 47 are currently running a deficit. At the same time, according to the National Treasury's *Budget Review and Outlook Paper* (2014), counties have been able to execute only 58.1 per cent of their aggregate budget. While this could be interpreted as the result of insufficient funds, it is more likely to be an indicator of the limited spending capacity at the county level.

Expenditure by counties absorbs 6.6 per cent of GDP (as reported in Table 8), a rather small share in comparative terms and taking into account the range of their competences. Of this amount, only a third of total revenue derives from counties' own revenue – KSh 97.9 million (US\$ 1.14 million) out of a total of KSh 291.3 million (US\$ 3.38 million), with the remaining two-thirds coming from central transfers. In reality, local expenditure is higher than what is shown in county budgets, as the central government currently pays some expenses, such as salaries for personnel transferred to work in counties, which should be included in county budgets (World Bank, 2012). The implementation of the 2013/2014 national budget signalled the beginning of the devolution of part of the central wage bill to counties, and this process will progressively rationalize the allocation of personnel expenditure according to the decentralization of competencies.

The future expansion of subnational expenditure will increasingly depend on their ability to generate their own revenues, particularly by increasing property taxes which are a major source of local tax revenues around the world. Data on the current level of property tax collections are not available, suggesting that collections are very likely to be negligible. If properly reformed and managed, property taxes should provide much higher revenue (1 per cent of GDP) than the current level (0.5 per cent of GDP).<sup>7</sup> This would allow for substantial improvement in the provision of basic services by the counties.

A key element of reforming the property taxes should include a revision of how property values are assessed. Centralization and strengthening of cadastres and registries is strongly advisable to ensure, among others, identification of missing registers of property. Subnational governments should also be authorized to set their own tax rates within brackets determined by the central government. This would increase fiscal accountability. Intergovernmental transfers could also include mechanisms to stimulate fiscal effort. These types of actions have been proposed by international organizations (World Bank, 2012).

## 2.5. CONSOLIDATED GENERAL GOVERNMENT

Consolidation of central and subnational government operations, as reported in Table 8, allows a more accurate illustration of the overall fiscal framework in Kenya. This is particularly needed as there are no official projections for subnational government operations. Subnational revenue and expenditure are

estimated on the assumption that growth in local revenue will match the growth in central revenue. These projections, being neutral, do not take into account the proposals put forth in this study, namely the remodulation of excises (see section 3) and enhancing property taxes (see previous analysis in section 2.4). They also do not include revenue from oil that is unlikely to start flowing in appreciable amounts before 2017-2018.

**TABLE 8. GENERAL GOVERNMENT CONSOLIDATED BUDGET OPERATIONS (IN BILLIONS OF KENYAN SHILLINGS)**

	2013-2014 revised	2014-2015 Projections	2015-2016 Projections	2016-2017 Projections	2017-2018 Projections
Central government revenue	1 006.4	1 181.2	1 352.2	1558.9	1 752.9
Central government own expenditure	1 451.0	1 780.3	1 800.5	1987.6	2 224.1
Transfers to subnational governments	193.4	232.7	251.5	269.8	289.2
of which: Equitable share	193.4	229.3	245.5	262.9	281.5
Equalization Fund	–	3.4	6.0	6.9	7.7
Subnational government transfers as a % of central government revenue	19.2	19.7	18.6	17.3	16.5
Subnational governments own revenue	26.3?	114.9	131.5	151.6	170.5
Subnational governments total revenue	291.3	347.6	383.0	421.4	459.7
Subnational governments expenditure	331.2	406.4	411.0	453.7	507.7
Total general government expenditure	1 337.6	1 587.6	1 763.2	2012.6	2 260.6
Total general government revenues	1 104.3	1 296.1	1 483.7	1710.5	1 923.4
General government overall balance	-233.3	-291.5	-279.4	-302.0	-337.1
Subnational government balance	-39.9	-58.8	-27.9	-32.2	-47.9
Gross domestic product (nominal)	4 985.1	5 559.3	6 290.4	7113.1	8 029.7
General government balance as a % of GDP	-4.7	-5.2	-4.4	-4.2	-4.2
General government expenditure as a % of GDP	26.8	28.6	28.0	28.3	28.2
Subnational governments expenditure as a % of GDP	6.6	7.3	6.5	6.4	6.3

Source: Authors' elaborations based on Republic of Kenya, The National Treasury, Budget Review and Outlook Paper, September 2014

Figures in italics are the authors' estimates of trends in subnational own revenue and expenditure based on trends in central government revenue and expenditure.

NB: Only FY 2013-2014 refers to actual budget figures. Subsequent years refer to official projections.

The projections show that:

- Total public, i.e. general government, expenditure on GDP would remain unchanged in the coming years. Keeping the share of public expenditure on GDP unchanged implies that, in absolute terms, expenditure would grow in line with GDP. Without changes in revenue, financing additional investment in the energy and the environmental sectors would require reducing expenditure in other

- sectors. These investment needs are significant. For example, according to UNEP (2014), green economy investments across different sectors are estimated to amount to KSh 135 billion (US\$ 1.57 billion), representing 9 per cent of the expenditure of Kenya's public sector.
- Projected expenditure growth is based on a similar growth of revenue, since the balance is kept unchanged. This means that all categories

of revenue, including local own revenues, should approximate the growth in GDP.

- Additional investment in the energy and environmental sectors could be mobilized without impinging expenditure in other sectors and

without requiring higher than GDP growth in revenues (at least in some categories of revenue) through the remodulation of excises on fuels and enhancing the property tax system, as suggested in this study.



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## 3 CHANNELLING OIL REVENUE FOR GREEN GROWTH

### 3.1. EXPLORATION AND EXPLOITATION PERSPECTIVES

The Government of Kenya is committed to defining the appropriate legal and fiscal regime for oil production, which is expected to begin in 2018. While this is an urgent measure to take, it is also important for the government to begin elaborating a medium to long-term financial plan covering most of the period when present oil reserves will begin to be exploited and to consider options for the efficient use of revenue derived from those reserves. Some uses are already broadly mandated by the constitution and its enabling legislation. There is, however, scope to complement and detail them in the new legal and fiscal regime framework.

### 3.2. PRODUCTION

Oil production is estimated to start in 2018 with a potential of about 600 million barrels of confirmed reserves.<sup>9</sup> Kenya has lower oil reserves than Uganda, which has 1.7 billion barrels confirmed from the same basin. However, prospective reserves could reach 1 billion barrels in Kenya.<sup>10</sup> There are also good prospects for gas.<sup>11</sup> If confirmed, oil reserves could result in Kenya being able to meet its oil needs within three to five years, thereby opening the way to possible oil exports. However, caution is needed when trying to determine future oil revenue, as actual reserves will only be confirmed once production has begun and potential uncertainties with Uganda using the same basin will also need to be taken into consideration.

Exploration fields are situated around Lake Turkana in northern Kenya. To be exported, oil will have to be carried by rail, road or pipeline to a port. An agreement signed between the governments of Kenya and Uganda foresees the construction of a pipeline linking their respective production areas to the port of Lamu in Kenya. However, if the agreement is implemented the financing of the project will still pose a challenge for both governments, given its size (with initial cost estimates of US\$ 3 billion).

The production area is entirely contained within the jurisdiction of the Turkana county – a large but sparsely populated area of 77,500 km<sup>2</sup>, with a population of about 785,000.<sup>12</sup> The Turkana region is also one of the poorest areas of the Kenya, with a poverty rate estimated at 87.5 per cent compared with the national average of 45.2 per cent in 2009.<sup>13</sup> Herders around Lake Turkana complain that oil exploration obstructs their activity and oppose the increased exploration and production activity. Oil exploration has been delayed in Turkana due to disagreements with herder communities and even suspended in 2013 following riots stemming from complaints about the insufficient creation of local jobs and excessive migration of working population from outside the region which increases pressure on ownership and use of land (Vasquez, 2013).

### 3.3. LEGAL AND FISCAL FRAMEWORK

A number of crucial steps need to be taken before the start of oil production in Turkana county, these include:

- Confirmation of commercially viable volumes of production.
- Definition of the legislative and fiscal framework, particularly petroleum legislation.
- Agreement on planning and funding of regional infrastructure (roads, rail, terminals), including drafting development plans in relevant areas.

Substantial investment, not only in infrastructure is required to start production, but also more importantly in transport infrastructure, including the pipeline linking the oil fields to the port of Lamu.

The oil sector is currently governed by: (a) the Petroleum (Exploration and Production) Act of 1986, last revised in 2012, related regulations and model of the production-sharing contract, (b) the Income Tax Act 2012 and relevant Finance Acts, and (c) the 2010 Constitution.

The Constitution stipulates that amendments to Kenya's Petroleum (Exploration and Production)

Act need to comply with the new constitutional dispensation to be passed by the end of 2015. However, progress has been very slow. In parallel to the review of the Petroleum Act, a draft Energy Bill was prepared and published in March 2013. As of 2015, the Bill has been revised or reviewed five times. While the Petroleum Act regulates oil contracts between the government and companies, the Energy Act sets the rules that govern the country's energy industry, including the sharing of oil and gas revenues. Together, they will provide the legal and fiscal framework for the oil sector.

The fiscal regime for exploitation and exploration will be based, as presently, on Production Sharing Contracts, which will be defined in greater detail

in the new Petroleum Act. The main structural characteristics of the existing contract will be maintained and follow the typical structure of production-sharing agreements by which the oil extracted is divided between cost oil and profit oil. The government's share of profit oil is progressive, with increases in price and production. Taxes are paid from the share accruing to the firm.<sup>14</sup>

The Energy Bill stipulates that the new contract will define the environmental obligations of the contracting firm, including provisions for decommissioning. Although environmental mandates (Article 144) are quite detailed, they do not refer to standards or to benchmarks other than reasonable levels of effort, attention and results. There are



also sanctions, but the process on how they will be applied has yet to be determined. Further elaboration is needed to improve the environmental components in the Energy Bill and strengthen monitoring and implementation mechanisms.

A national Fossil Fuels Advisory Committee, composed of the top officials of the executive agencies of the central government related to oil operations and to the environment, will be responsible for management decisions, including the selection of contractors and the negotiation of the terms of contract (Energy Bill, 2015).

### 3.4. EXPECTED REVENUES IN THE OIL SECTOR

Revenue will derive from direct sales of oil (the government share of profit oil) plus taxes and fees, including a signature bonus; an annual fee based on the area of exploration and exploitation; an annual fee, denominated ‘royalty’, whose structure and amount is also to be determined; an income tax with a general rate of 30 per cent, but whose structure and rate shall be adapted to the specificities of the oil sector; and finally, an already approved tax on capital gains deriving from the sale of exploration and exploitation licences which has special rates for oil and gas companies, ranging from 35 to 37.5 per cent. The aim of the capital gains tax is to curb corrupt practices, including instances whereby a company linked to the government with no operational capacity obtains a licence at a very low price and resells the licence with a huge gain to a (usually) foreign company that has the capacity and skills to proceed to exploitation. This practice has frequently been observed around the world.

### 3.5. ALLOCATION OF OIL REVENUE AND ENSURING REVENUE DISCIPLINE

The Energy Bill replicates Article 133 of the Constitution which addresses land ownership. This Bill explicitly states that the ownership of oil is “vested in the national government in trust of the People of Kenya”. The proceeds accruing to the government from exploitation are to be shared, according to the Energy Bill, between the

central government, county governments and local governments (where they currently exist or when they will be created in the future) situated in oil production areas. The total share distributed to counties and to other local governments situated within their jurisdiction is 20 per cent. Of this 20 per cent, local governments situated in each county will receive 25 per cent, while the county government will receive the remaining 75 per cent.<sup>15</sup>

As mentioned above, the Energy Bill also mandates the creation of a Sovereign Fund, capitalized by discretionary allocations from the central government (decision-making power is assigned to the Cabinet Secretary of the Treasury), with a minimum yearly deposit of 5 per cent of government proceeds. Resources from the Fund, when not saved for future generations, will be used for financing infrastructure and for stabilization purposes. The detailed structure of the Fund is subject to further legislation.

### 3.6. ESTIMATING THE SIZE OF OIL REVENUES

The size of prospective oil revenues is a crucial preliminary element in considering options for the allocation and use of oil revenues. The estimates of potential revenues presented in Table 9 facilitate the assessment of various options. However, some caution is needed. Firstly, no official estimates of oil production are currently available for Kenya. Secondly, the fiscal regime is still not defined and production costs can only be derived from broad averages applying to other African countries. Finally, the price of oil is subject to wide fluctuations around a non-determinable trend, as illustrated by recent events. In view of these uncertainties, and limited availability of information, Table 9 is built on the following criteria and assumptions:

- Two alternative volumes of expected reserves are considered: the first derives from Tullow Oil,<sup>16</sup> the second considers other operators, e.g. Africa Oil, Taipan Resources and other minor operators.
- The production span is taken to last 30 years. This is a fairly long period, but it takes into consideration the present difficulties of starting production.
- Production is constant over the years, which is unrealistic, but allows estimates of average values for revenue.

- The cost of production is estimated to be US\$ 45 per barrel. This is a rather high estimate for onshore exploitation, but it takes into account prudential difficulties of starting production in Kenya and the incidence of transport costs.<sup>17</sup>
- Two prices for oil are taken by hypothesis:<sup>18</sup> US\$ 100 and US\$ 60, respectively.
- To the previous cost borne by the producing companies, the cost for infrastructure and services provided by subnational governments is added. This cost is estimated at US\$ 2 per barrel and while this is an estimate by the authors, it serves as a benchmark. It might be approximated by excess, considering that the total production cost borne by companies for oil in the most favourable natural circumstances, such as in the Persian Gulf, is estimated to be less than US\$ 10.<sup>19</sup> Even in a very favourable context, it is hard to imagine that the cost that governments can bear is higher than 20 per cent of the total production cost.
- The government take, i.e. the sum of the share of profit oil going to the government plus taxes and fees, is assumed to be 60 per cent of the net rent value of production minus all costs. This value is suggested by the literature (IMF, 2012; Nackle, 2010) for countries with similar fiscal regimes for the oil sector.<sup>20</sup>

Under these assumptions, the yearly revenue accruing to the government would vary between US\$ 156 million, with a low oil price and low reserves, to US\$ 1,060 million with a high oil price



and high reserves. In per capita terms, revenue will range from US\$ 3.5 to US\$ 24 per annum.

With these values in mind, some possible options concerning the use of oil revenues can be explored, in view of both the fact that new oil sector legislation still has to be passed by Parliament and also, when finally approved, it will still require government or Parliamentary decrees to be implemented.

### 3.7. OPTIONS FOR THE USE OF OIL REVENUES

This section provides an illustration of the following options for using oil revenues in Kenya.

1. Sharing part of the rent with subnational governments.
2. A Sovereign Wealth Fund to ensure intergenerational equity.
3. A Stabilization Fund.
4. Direct cash transfers to individuals.
5. Creation of Sector Funds, inserted in the Single Treasury Account, such as for funding green economy projects, with selection of priority sectors.

Among the five options, the first two are already mandated. The other options are derived from literature and practice.<sup>21</sup> Two of them, the Stabilization Fund and the Sector Fund, merit further consideration and eventual adoption in Kenya. The proposed options that follow are, in principle, not mutually exclusive. For example, some sharing with subnational governments for compensation of environmental damages is compatible with setting up a special fund for green investment at the central level. Similarly, the creation of a Sovereign Wealth Fund (SWF) is not incompatible with the creation of a Stabilization Fund. Complementarities have to be taken into consideration. Compatibility between some options also depends on the size of actual revenue.

### 3.8. INTERGOVERNMENTAL SHARING

As illustrated above, the Energy Bill mandates the allocation of 20 per cent of oil revenue to counties in production areas, with an additional obligation of sharing 25 per cent of this allocation with local governments. However, there is political pressure

**TABLE 9. ESTIMATES OF PRODUCTION AND GOVERNMENT TAKE WITH ALTERNATIVE PRICE AND RESERVE ASSUMPTIONS<sup>22</sup>**

Location of reserves	Tullow	Tullow and other reserves
Expected reserves (in barrels)	600,000,000	1,000,000,000
Life production span (in years)	30	30
Annual average production (in barrels)	20,000,000	33,333,333
Value of production, with price per barrel= US\$ 100	2,000,000,000	3,333,333,333
Value of production, with price per barrel US\$ 60	1,200,000,000	2,000,000,000
Total cost of production and transportation paid by firms: (with cost per barrel US\$45)	900,000,000	1,500,000,000
Total cost of public infrastructure and services necessitated by production and borne by subnational governments (with the cost per barrel at US\$ 2)	40,000,000	66,666,667
Total cost (in US dollars)	940,000,000	1,566,666,667
Net rent (value of production – total cost), with the price per barrel at US\$ 100	1,060,000,000	1,766,666,667
Net rent (value of production – total cost) with the price per barrel at US\$ 60	260,000,000	433,333,333
Government take (60% of net rent) with price per barrel of US\$ 100	636,000,000	1,060,000,000
Government take (60% of net rent) with the price per barrel at US\$ 60	156,000,000	260,000,000
Shared revenue to subnational governments with price per barrel at US\$ 100	127,000,000	212,000,000
Shared revenue to subnational governments with the price per barrel at US\$ 60	31,200,000	62,000,000

to increase the share received by counties to more than 20 per cent. This may pose problems if beneficiary governments have insufficient spending capacity or if non-producing areas begin to lodge claims to have access to a share of oil revenues. This issue requires attention. If it is not properly managed, intergovernmental sharing may become a source of conflict.

Intergovernmental sharing is a widely used system in Africa for funding local governments.<sup>23</sup> There is however increasing evidence that subnational governments face problems when managing, and more specifically, spending revenues quickly and efficiently.<sup>24</sup> Some key challenges related to intergovernmental sharing are set out below:

**Volatility of revenue.** Generally, the central government is considered to be better equipped than subnational units to handle revenue fluctuations given its access to a wider range of financial instruments. When revenue diminishes rapidly, subnational governments have to resort to

expenditure cuts, thus endangering the provision of minimum levels of essential services, such as education and health. During upturns in prices, subnational jurisdictions can be literally awash in money that they are unable to spend efficiently, or make spending commitments that might not be sustainable in the longer term. Furthermore, price fluctuations make non-renewable resource rents an “unreliable” source of revenue. As a consequence, “reliable” expenditure, such as salaries and other current expenditures, carry higher risks which subnational governments are not equipped to handle.

**Misspending of rent.** Efficiency losses can also arise from misspending due to insufficient absorption capacity and/or from corruption. The geographical concentration of the rent can be disproportionate to the absorption capacity of subnational government units (sometimes, it is even disproportionate to the absorption capacity of the national government). Non-rentable investments can be made, subnational bureaucracies may indulge in slack and the capacity of controlling costs may decline. These problems are

usually context specific, meaning that the central government does not have an inherently superior capacity in administering funds, but the sheer size of revenue may constitute a greater challenge for smaller governments. This is especially true in developing countries with generally weak or incipient traditions of local administration. The same argument is particularly relevant in the case of Kenya.

**Corruption.** The same arguments can be made concerning the impact of corruption. Prevalence of corruption at either the national or local level depends, among other things, on a number of factors, including: information availability, specificities of the political system, administrative traditions, the homogeneity of local jurisdictions, and sector composition of expenditure at the national and local level. However, concentration of resources within a small jurisdiction may generate rent-seeking and/or corrupt behaviour, which once again depends on the size of local government and the size of the rent.

Despite the challenges outlined above, the allocation of a part of revenues from natural resources to subnational governments is justified on the basis of equity and economic criteria when subnational governments provide infrastructure and/or services to the firm or workers in the region. Examples include roads, transport and communications, schools and health services to the workers employed in oil fields and mines, and their families. Oil firms would have to provide these services and pay higher wages if these were not provided by the subnational government. Subnational governments are entitled to a share of the final price, not only because they have a sovereign right to the rent, but because they are production partners. Payments to the government should be calculated on the basis of the value of these services. The relative importance of costs refunded to the central, regional or local government will depend on their respective responsibilities. A more decentralized regional government with extensive expenditure responsibilities will receive a large part of the value of the production, independent of its claims to receive a large part of the rent.

Compensation for environmental damages is also very important, but a distinction needs to be made between two cases:

↘ Where property rights are well defined, exploiting firms have to comply with government regulations

and/or environmental taxes set by the government. In this case, if companies comply with applicable standards or pay the tax, they have an additional compliance cost for environmental damages associated with their activities.

↘ Where property rights are not defined and environmental standards are not issued nor enforced, companies are responsible for environmental damage, while the cost is borne by society at large. The most frequently referred to example of this is in the Delta River in Nigeria, where oil spills and leakages of petroleum from pipelines caused serious damage to the environment. When this type of environmental damages occurs, society should be compensated proportionally to the expenditure needed to comply with applicable standards,<sup>25</sup> or, alternatively, to the foregone tax revenue. However, it is not always clear who is entitled to this compensation and more precisely, which individuals or levels of government are entitled to receive compensation. In principle, beneficiaries should be individuals affected by the environmental impact of oil activities and other natural resource exploitation. Moreover, compensation is in principle targeted to repair damages, which implies collective action.

A basic simulation of the impact of increasing the share of oil revenues allocated to counties above 20 per cent provides insights on the feasibility of this option. If the allocation share of 20 per cent assigned to the Turkana region is disbursed, its revenue will vary between US\$ 31.6 million and US\$ 212 million according to the various scenarios, with huge fluctuations linked to price variations. Per capita amounts would be high, as Turkana only has a small proportion of the total national population. In per capita terms, the annual allocation would vary from a minimum of US\$ 198 to a maximum of US\$ 1,350 – a multiple of its present per capita GDP. Hence, it is questionable whether such a high increase is reasonable.

One alternative is to remunerate county governments (presently only Turkana, but possibly other counties and their local governments in the future) through transfers that refund the full cost of infrastructure and services linked to oil exploration and exploitation, rather than through a predetermined share of revenue. According to estimates by the authors, this alternative would provide a revenue of between

US\$ 40 and US\$ 66.6 million to the Turkana region. This seems to be more reasonable than the fixed 20 per cent share, and would allocate more than the present statutory 20 per cent share in the case of low oil prices. This formula would also limit the impact of fluctuations in oil prices on revenue as any allocation is linked to production and not to oil prices.

### 3.9. SOVEREIGN FUNDS FOR GREEN INVESTMENT

The Energy Bill mandates the creation of a SWF with a minimum deposit of 5 per cent of annual revenue. The National Sovereign Wealth Fund Bill (2014) established the three following funds: the Stabilization fund, the Infrastructure and Development fund and the Future Generation fund. The Stabilization fund is aimed at insulating the national budget and the economy from the volatility of mineral and petroleum revenues, and levelling out current spending. The Infrastructure and Development fund is aimed at providing resources for infrastructure for social and economic

development. The Future Generation fund aims to manage savings for future generations, using revenues from minerals and petroleum reserves and from the exploitation of other exhaustible natural resources.<sup>26</sup>

Several issues need to be carefully considered when creating the SWF and reinvesting fund revenues. Most natural resources, including oil, are exhaustible, meaning that their use leads to the depletion of stocks. This raises a concern about intergenerational equity, as the use of resource revenue by the present generation has to a certain extent to be balanced with the availability of resource revenue for future generations. Consideration of intergenerational equity brings the use of exhaustible resources within the broader issue of sustainable growth. Intergenerational justice would be violated if the present generation profit from a natural resource revenue at the expense and well-being of future generations.

With specific reference to resource revenues, a number of criteria could be considered. The most widely applied criterion is the Hartwick rule (1977),



which broadly suggests that in an economy with stationary technology and a stable population, the reinvestment of all resource revenue into reproducible capital is a sufficient condition for ensuring stability of consumption, or utility, over time.

Another approach to sustainability is the Permanent Income (PI) concept, which prescribes that revenues from exhaustible natural resources should be saved and only their permanent or annuity value spent every year. This approach foresees the creation of a SWF and, among other things, the elaboration of criteria for determining deposits, withdrawals and use of these assets.

The Permanent Income Hypothesis (PIH), a more conservative version of the PI, mandates that all natural resource revenue should be channelled to a fund, such as the Norwegian Pension Fund, and that only the real revenue generated by the fund should be used for consumption.

These criteria suggest that a non-renewable resource should not be consumed by the present generation, but rather converted into income-generating assets. The criteria have a clear appeal in terms of sustainability, but do not offer enough guidance on intergenerational equity.

The main issue at stake when deciding about the appropriateness of saving for the future is the dynamics of income and consumption over time. If, for example, a country is likely to experience rapid dynamic future growth, making future generations much richer than the present one, it would be unfair in intergenerational terms to constrain the use of natural resources by the present generation to leave resources to future, richer generations. This objection is particularly applicable to poor countries with pervasive levels of poverty. If expectations are for rapid future growth, this would allow almost the entire population to escape from poverty. In this scenario, the partial or full spending of resources by the present generation may be optimal and just, particularly if spending produces benefits that will also extend to future generations, for example the construction of hydroelectric power plants.

Furthermore, countries have to take into account that managing, monitoring and controlling the investment and disbursement policies of sovereign funds is a

costly activity, particularly for developing countries that need to acquire the support of specialized agencies. When fund reserves are not large – as is possibly the case for Kenya in view of the present amount of confirmed reserves (see discussion in section 3.6) – these costs can absorb a substantial share of the reserves. The latter makes this option less attractive, even in the high price scenario particularly considering that minimum mandated deposits to SWF will only be a fraction of oil revenues.

Most natural resource-producing countries have introduced SWFs with a variety of structures and rules. One of the best examples is the Norwegian Pension Fund, whose management and oversight rules could be replicable in Kenya. However, the Fund's deposit policy would not be applicable as it would imply allocating almost all oil revenue to future generations only (see Box 1).

**Creation of a Sovereign Wealth Fund in Kenya.** The mandate of the Energy Bill to create a SWF with a proposed minimum deposit of 5 per cent of annual oil revenues accruing to the central government (the “government take”) needs to be strengthened. Under the current set-up, there is a risk that the small-sized reserves could be completely absorbed by fixed administration costs. A SWF could become viable with the more favourable scenario of high production and high prices, and more importantly would require a much higher minimum deposit rate. Assuming that 50 per cent of the central government take (that is, after deduction of the 20 per cent share to subnational governments) goes to the SWF, the Fund would accumulate, according to the estimates in Table 10, about US\$ 6.3 billion over 30 years. To these reserves, revenue from the investment of reserves would be added and withdrawals deducted. Assuming that investment revenue (net of management costs) is equal to withdrawals, when exploitation of oil reserves is launched the Fund would generate revenue amounting to US\$ 250 million per year, less than US\$ 5 per inhabitant depending on demographic growth. This level of revenue is based on the assumption of a 4 per cent yearly rate of return, as in the case of Norway. In less favourable scenarios, the share of government take to be deposited in the Fund should be much higher to compensate management costs and generate meaningful investment revenue. However, this would run against the needs of the present generation.

## Box 1.

# Norway's Sovereign Wealth Fund<sup>27</sup>

The Norwegian Government Pension Fund Global (GPF) is the world's richest sovereign fund. At the end of 2013, the fund held total reserves of about US\$ 840 billion and generated a net income of US\$ 115 billion in 2013 profiting from huge advances in American and European stocks.

The GPF was created in 1990 as the Petroleum Fund of Norway and changed its name in January 2006 to the GPF. All the government's petroleum revenues are deposited directly into the Fund and a limit on annual withdrawals from the fund has been set at 4 per cent of Fund assets, regardless of whether the Fund earned more or less than that in a given year. More precisely, Norway has a fiscal rule that allows the central government to maintain a structural non-oil budget deficit, whereby total expenditure is confronted with all revenues excluding those generated by oil. Resources accumulated in the Fund can be used to cover the non-structural deficit up to an amount corresponding to 4 per cent of the total reserve. This 4 per cent threshold corresponds, according to official estimates, to the real net profit deriving from long-term investment of the resources of the fund. A calculation for 2013 shows that a 4 per cent maximum allocation to the government budget amounted to US\$ 33 billion, which is less than a third of the net income (the above-mentioned US\$ 115 billion). The size of Norwegian reserves is big enough to allow full budget stabilization without impairing the accumulation policy of the Fund.

Source: Compilation by the authors

### 3.10. STABILIZATION FUND

A Stabilization Fund is a feasible option for Kenya, although no provision has yet been made in the current legal and fiscal structures. Such a Fund would temporarily absorb a share of the government take. This share would be determined annually by the difference between the current price and a benchmark, for example the average price of oil over the previous five years. The Stabilization Fund would ease many of the problems associated with revenue fluctuation, thereby improving the efficiency of spending.

Given expected resource revenue fluctuations, the idea of setting apart reserves during 'fat' years to compensate for the loss of resources during 'lean' years has found renewed popularity in the literature and in practice in recent decades, particularly in natural resource rich countries. Prices of minerals and hydrocarbons and quantities produced are prone to fluctuations due to global economic cycles and technological developments. In turn, these fluctuations are transferred to government revenue through the fiscal regime and may be amplified

through the use of progressive taxes, which are needed to ensure the government can benefit from windfalls due to price increases.

Stabilization of the flow of resources is intertwined with the saving of the same resources. However, the two issues have to be kept separate. Stabilization is a recurrent necessity and does not need to be related to the amount of the resources available. In other words, all countries need to stabilize their resources, while the opportunity of saving them is more dependent on their level of wealth. Developing and poor countries with natural resource reserves have urgent expenditure needs and also need to build up social and green infrastructure for a green economy, making savings less urgent than in rich industrial countries. Stabilization in the context of huge oscillations in prices can be achieved with a multiplicity of instruments, e.g. hedging against risk, stabilization funds and fiscal rules.

A number of countries have set up specific Stabilization Funds (Box 2). These funds operate at both the national and at the subnational level. An increasing number of countries combine stabilization

## Box 2.

# Some country experiences with stabilization funds

All levels of government use Stabilization Funds, in particular the central government. Pure stabilization funds have been introduced at the central level in Algeria and Mexico. The *Algerian Fonds de Régulation des Recettes (FRR)*<sup>28</sup> aims to smooth the long-term profile of public expenditure, service the stock of public debt, and restore the amount of foreign reserves when there is a decline. If the price of oil goes above a determined level, revenues are transferred to the fund, which are then used to fund domestic infrastructure investments. There is high discretion on their use.

The *Constitutional Budget Reserve of Alaska (CBR)*<sup>29</sup> is an interesting example of a mixed stabilization and saving fund operating at the subnational level. This is the largest existing subnational stabilization fund, but a 2003 reform of the CBR inserted a saving fund in the body of the existing stabilization fund due to the abundance of oil revenues flowing to the State of Alaska. This duality could, especially in the long run, serve as model for a stabilization fund suited to the reality of natural resource rich countries.

In parallel with the CBR, Alaska has a *Permanent Fund (APF)*<sup>30</sup>, established in 1991 to absorb short-term oil revenue variability. Deposits into the CBR consist of settlements of tax arrears and other revenues owed to the State of Alaska. Deposits in the budget reserve fund have to be invested so as to yield competitive market rates to the fund. This income must be retained in the fund. In addition to the provision of finance in case of a shortfall in revenues, stabilization funds can also help finance emergency actions, primarily created by natural disasters.

Source: compilation by authors.

funds with saving funds, while the majority of natural resource-rich countries have savings funds. The increasing importance for public budgets of revenues from the exploitation of non-renewable natural resources has led experts and international organizations to increasingly exert pressure for the introduction of pure stabilization funds.

Stabilization funds are characterized by procedures governing deposits and withdrawals and the imposition of caps and/or thresholds on their reserves. The most appropriate instrument for transparency, and possibly for effectiveness, is the use of formulas. The main advantage of using formulas is the reduction of political interference as the transfer of money into the funds is automatic once indicators used in the formula reach a predetermined value. In principle, rules may increase the stabilization properties of the funds.<sup>31</sup>

The same considerations made in the choice of deposit systems also apply to withdrawals.

However, to be recommended for reducing excessive discretionary decision-making power, formula-based rules cannot be envisaged for exceptional withdrawals from the funds, as take place in the case of natural disasters. In such cases, special procedures have to be introduced leaving discretionary decision-making power to the executive or legislative branches. Some discretion should be allowed in the case of protracted falls of revenue, although the availability of saved reserves acts as the main constraint on decision-making.

### 3.11. DIRECT CASH TRANSFERS

Proponents of the direct allocation of natural resource revenue to individuals claim that it is grounded on a universally recognized entitlement. Wenar (2008, p. 15) argues: “The fact that the people of a country own its natural resources is part of a common-sense understanding of today’s world. It is therefore no surprise to find that the nations of the world have

embedded this fact deep within international law”. He quotes a few constitutions, such as those of the Plurinational State of Bolivia and Iraq, prescribing that natural resource revenue “pertain to the people” and the major human, civil and political rights’ treaties, which have perfectly analogous principles.

However, even constitutions and especially constitutional mandates do not adequately settle the issue of the allocation of natural resource revenue. Ownership is not the only determinant of allocation. A number of countries, such as the Plurinational State of Bolivia, Italy, Mongolia, and the State of Alaska allocate cash transfers deriving from natural resources to their citizens (cf. Brosio and Singh, 2014). As a matter of fact, when the constitution is explicit about their rights vis-à-vis natural resource revenues, citizens still need the intermediation of the government to extract the rent to their benefit, as well as an explicit decision on the allocation mechanism to implement under the constitutional mandate. The government could also claim that it is operating in the interest of its citizens, following its mandate and that citizens are final beneficiaries of the rent, even when the latter is not directly allocated to them through cash transfers. In other words, the actual allocation is a matter of political decision-making and not simply of legal entitlements.

Government failures are one of the main reasons in support of cash transfers. Cash transfers are seen as a mechanism for addressing government failures and even improving the equity of the tax/expenditure mix. Most proposals foresee transfers to individuals that would be liable for paying income tax, as an ordinary income (Moss, 2011; Devarajan, Le and Raballand, 2010; Sandbu, 2006). This would oblige state authorities to build a tax administration in order to collect part of the natural resource revenue transferred to individuals. Under this scenario, the state is obliged to demonstrate that these resources have been put to good use and to become more accountable to citizens.

Clearly, the efficiency of turning oil into earned revenue through income tax in the context of a developing country where only a small percentage of tax payers file tax returns is questionable. Moreover, individuals will receive a transfer net of tax without the possibility of checking the amount that was been withheld. A similar argument points to the incentive

that direct cash transfers would give to citizens to increase transparency in the management of natural resource revenue. As direct beneficiaries, they should be more interested in carefully monitoring the various steps through which resources are allocated to them, starting from the payment of taxes and royalties from extracting companies to the final disbursement. Given that checking cash transfers requires less skills and information than checking a complex web of revenue and/or expenditure, this option may be a more practical solution to consider. Initiatives advocated by a group of governments and nongovernmental organizations, such as the Extractive Industries Transparency Initiative (EITI), aim at ensuring transparency at all management stages of natural resource revenue, and need to be taken into account.

A third argument is that cash transfers, if distributed in equal per capita amounts, could have an immediate and significant economic impact on poor households, and ultimately on development. For example, estimates for Uganda show that with oil production accounting for 10 per cent of GDP, a full and uniform distribution of the rent would provide US\$ 50 per year per head and could even double the income of large families at the bottom of the income scale. This would enable members of these families to increase investment in nutrition, health, education and even micro-enterprise (Gelb and Majerowicz, 2011). The advantage of direct distribution has to be compared with its counterfactual, namely public sector use of the revenue. In this latter case, natural resource revenue would accrue to the public budget, which is then spent by the government. The value of the marginal fiscal residuum, i.e. the difference between the revenue paid (in this case the foregone transfers) and public expenditure per individual or household, will depend on the distributional impact of the expenditure. There will be no impact if the value of public expenditure is the same lump sum for everybody. If the total size declines in line with households income or income of the individual, then direct use by the public sector is better for the poor. The opposite prevails if the total amount of the expenditure increases with income. According to Segal (2011), the direct allocation of natural resource revenues (mostly from oil) to individuals in Mexico would improve equity considerably by increasing the fiscal residuum of the poorest segments of the population. This paper has initiated

much debate in Mexico as it raises questions on the equity of the current tax/expenditure policy.

These arguments do not consider one of the presumably most important factors in the evaluation of direct transfers as opposed to public sector use of national resource revenue (NRR), namely the size of leakages taking place in the public revenue/expenditure process. For direct cash transfers, the circuit is very short, while it is extremely long for the public revenue/expenditure circuit, and there is no direct evidence of leakages in cash transfers. In a paper on education transfers paid by the Government of Uganda to local authorities, Reinikka and Svensson (2002) show that only 13 per cent of non-wage expenditures reached schools. Most of the allocated

funds were used by public officials for purposes not related to education, or were used for private gain. When graft and corruption prevail, the final amount that citizens receive after officials and bureaucrats have siphoned out of public funds is considerably less than intended.

There are also reasons against using cash transfers, for example direct cash transfers deny cash-strapped governments the opportunity to improve service delivery to citizens, and distribution creates entitlements that can become hard to maintain. Should the oil price decline, individual allocations should also decline, thereby jeopardizing the continuity of the entitlements, and putting pressure on the government to finance the transfers with revenues from other sources. In addition, the literature provides two broad and intertwined arguments against cash transfers. The first focuses on the possible neglect of future generations if natural resource revenues are transferred directly to the present generation. The second is that direct cash transfers are likely to be spent only for consumption and imply a neglect of investment in both future and current needs (e.g. capital accumulation). Environmental concerns can add weight to arguments against the use of direct transfers to individuals as they, particularly in developing countries, may not pay sufficient attention to the need to preserve the environment.

**Cash transfers to individuals in Kenya.** The Kenyan Constitution is open to a range of interpretations on the issue of cash transfers. The central government is assigned responsibility for the management and use of natural resource revenue on behalf of citizens. This mandate is consistent with both direct use of revenue by the government(s) and its allocation to citizens with direct transfers. Cash transfers would clearly alleviate the problems deriving from corruption and mismanagement of public funds.<sup>32</sup> However, cash transfers would reach an amount that would make this instrument worthwhile only in the high price scenario. Transfers would amount to a yearly universal allocation of US\$ 14 per capita per year under the low reserves scenario and to US\$ 23.5 per capita under the high reserves scenario. In the latter case, the transfer would not be irrelevant depending on the size of the household level, i.e. it would amount to more than US\$ 100 for a family of five members.



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### 3.12. CONSTRAINTS ON THE USE OF FUNDS, INCLUDING THE CREATION OF SECTOR FUNDS

Countries try to foster the efficient use of natural resource revenue by imposing constraints on the use of these resources through earmarking. The most constraining instrument is the creation of special funds, where natural resource revenues are channelled for use in specific purposes, such as environmental protection, technology, or green growth investment. Table 10 provides an overview of significant international practices in this regard. Constraints apply mostly to central governments, whereas international evidence provides a small number of cases where constraints on revenue use are imposed on subnational governments.

Constraints on use are popular mostly in Latin America, but they are also used in some industrial countries, such as Italy. Recent reforms in the Plurinational State of Bolivia and Colombia have recentralized part of natural resource revenues and at the same time increased constraints on uses by the central government. For example, the revenue is used for payment of pensions in Plurinational State of Bolivia and for science, technology, environment and regional government in Colombia.

**A special fund for oil revenue use in Kenya.** The last option – the creation of a special fund for green-growth investment with a focus on technology innovation – appears to be among the most sensible solutions to ensure that future oil revenues are used efficiently and equitably, provided that it is able to

**TABLE 10. INTERNATIONAL PRACTICES IN CONSTRAINING THE USE OF NATURAL RESOURCE REVENUE**

Country	Level of beneficiary government	Resource revenue source	Earmarking	Current / Capital	Sector / Programme
Argentina	Central Provinces	Income taxes Royalties	Yes		20 per cent to social security administration
Plurinational state of Bolivia	Departments Municipalities	Royalties Royalties	Yes	85 per cent public investment	10 per cent projects in various areas
Brazil	Central	Royalties signature bonuses and income tax	Yes		Full amount to Oil National Agency, Min. of Environment, Science & Technology, Navy
Colombia	Central Subnational	Royalties Royalties	Yes	Projects in social sectors may include current and capital expenditure but must be vetted by special supranational boards	25 per cent on science & technology; environment; Pension reserves.
Ecuador	Central (<2007) (>2007)	Net oil revenue	Yes	Only spending on physical and human capital	15 per cent on defence; 10 per cent on other sectors. Small amount to development projects in Amazon region (where oil is produced)
Italy	Local and regional	Royalties		Regional growth, environmental protection	To residents
Mexico	States	Excess oil revenue	Yes	Infrastructure and equipment	
Nigeria	All	Oil revenue	No		
Peru	Subnational	Royalties and income tax	Yes	75 per cent or more on capital spending; at most 20 per cent on maintenance and 5 per cent on feasibility studies	
Alaska (United States)	State	Oil fund returns	No		Dividends to Alaska residents

Source: Authors' compilation from various sources, including IMF

stimulate growth in the short-term. Such a special fund, which is not yet mandated by the existing legal and fiscal discipline, could receive the largest share of oil revenue and should therefore be given a high priority.

This special fund would be compatible with a system of intergovernmental sharing that remunerates, as suggested here, only the cost of infrastructure and services provided by oil producing areas and refunds the costs for compensation of damages from oil operations. This system of intergovernmental sharing would leave enough resources for meaningful environmental

use. The fund would also be compatible with a stabilization fund, as it would only modify the temporal profile of spending.

Due to the prospective size of oil revenues, the special fund would represent an alternative to a SWF. As a possible solution to accommodate the legal constraint on the mandatory creation of a SWF, a legal provision could be inserted prescribing a strict earmarking of revenue for environmental use. In other words, the SWF would be relabelled as the Green Sovereign Fund (GSF). The proposed GSF would be a viable alternative to direct cash transfers provided that spending through the Fund is efficient.



© Affendi Shahidan – Solar panel on a roof.

## 4 TAXATION OF FUELS

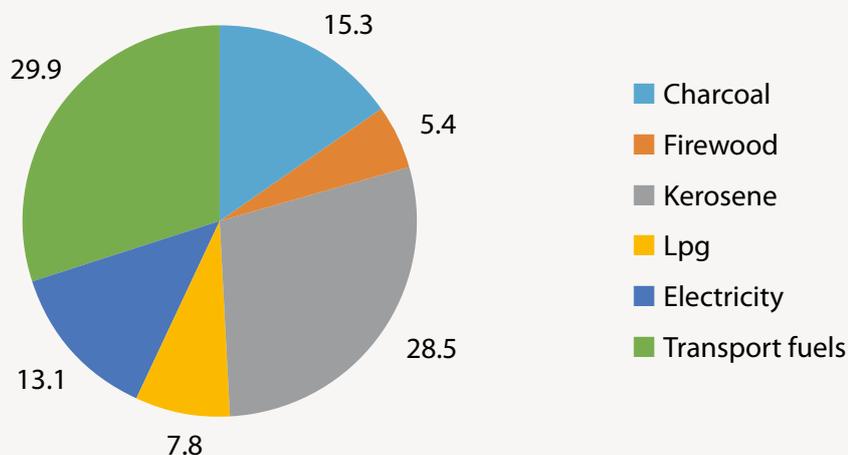
### 4.1. BACKGROUND

Fiscal instruments can contribute to reorienting current energy use towards cleaner alternatives. In Kenya, the key priorities for a transition towards a low-carbon, resource efficient and less environmentally damaging development path are concentrated in the residential and transport sectors (NCCFP, 2014).<sup>33</sup>

Energy absorbs 5.8 per cent of total household expenditure in Kenya.<sup>34</sup> Lighting and cooking absorb about 70 per cent per cent of total energy expenditure, with transportation accounting for the remaining 30 per cent (see Figure 3). About 80 per cent of households depend on charcoal and fuel wood for their domestic energy needs, e.g. cooking and water and house heating. More precisely, 82 and 34 per cent of urban and rural households, respectively, rely on charcoal for heating and cooking. In rural areas, wood is the predominant domestic fuel. However, it has a significant environmental impact in terms of indoor pollution, deforestation and soil degradation. It has been estimated that forests cover only 6 per cent of total land area in Kenya, and that they are decreasing at a rate of 0.09 per cent per year (IIED, 2010). Also, most of the wood (90 per cent) is harvested for fuel uses.

While charcoal is not exempt from VAT, no excise is applied on it. Charcoal and wood are difficult to tax effectively, as both are largely produced and traded in the informal sector. A reduction in the trade and use of charcoal would be desirable not only for environmental and health reasons, but also for corruption and crime control. Bribes taken along the whole production and distribution chain represent a huge share of the final price, ranging from 20 to 30 per cent in Kenya (Mwampamba, Ghilardi, Sander and Chais, 2013). Introducing a tax or fee on logging and crediting these amounts to the budgets of subnational governments, as applied in Cameroon, would contribute to reducing the use of charcoal and wood and promoting more sustainable management of local forest resources. The fee would increase the price of timber and, if substantial enough, would lead to a reduction of logging, thereby decreasing the amount of inputs for charcoal and fuel wood. It would also generate incentives to subnational governments to control illegal logging. At the present time, however, this appears to be a somewhat difficult policy to implement, since subnational governments are just starting to operate under their new constitutional mandates. Once local capacity is enhanced, this could become a relevant and sensible policy option.

**FIGURE 3. HOUSEHOLD ENERGY CONSUMPTION, BY PRODUCT AND PERCENTAGE OF TOTAL EXPENDITURE ON ENERGY (2013)**



Source: Authors' estimates based on KHBS (2005).

Most domestic lighting is based on conventional lamps fuelled by kerosene, which is not only dangerous and polluting, but also has a negative impact on human health (UNEP, 2014; Jacobson et al, 2013). Kerosene is also very lightly taxed. There are a number of proposals from the government and civil society in Kenya to promote a shift of household consumption away from kerosene and towards the use of cleaner fuels such as LPG and electricity. Heavy investment in infrastructure is likely to be needed to achieve a substantial shift in this regard.

Transport is a sector facing rapid growth and its development path needs to be steered towards sustainability by reducing traffic congestion, accidents, global and local pollution. Hence, taxation of transport fuels and kerosene should be reformed to reflect environmental damages caused through the use of such products and to create much-needed fiscal space to finance green growth investments and curb externalities. Kenya's Scaling-Up Renewable Energy Programme (SREP) of 2011 provides an estimate of the scale of investment needed to support renewable resources (geothermal, solar and improved access to the electricity grid). Referring to the projects included in financing plans with a duration of five years the total amount of projected investment is US\$ 928 million, of which US\$ 132 million should come from government, US\$ 85 million from SREP funding, US\$ 320 million from leading financial partners (the African Development Bank and the

World Bank Group), and the remaining expenditure provided by other financial partners. The Lake Turkana Wind Power Project, potentially the largest single renewable energy project based on wind power in Africa, is expected to provide about 300 MW of clean energy to the national electrical grid, using wind turbines located in Marsabit County. The total cost is expected to be more than US\$ 620 million, representing one of the largest renewable energy investments to date.<sup>35</sup>

The current low level of oil prices also represents a unique opportunity for fuel tax reform. On the one hand, it creates economic and political space for a slight increase in taxation. On the other hand, the reform will help to maintain more stability in the price of fuels, which is needed to maintain incentives to control consumption.

## 4.2. A CORRECTIVE TAX ON TRANSPORT AND RESIDENTIAL FUELS

### Present taxation

Retail and wholesale prices of transport fuels are regulated by the Ministry of Energy and updated periodically. The burden of taxes and fees on transport fuels, as can be seen in Table 11, amounted to KSh 31.79 (US\$ 0.37) per litre of gasoline in

**TABLE 11. BURDEN OF TAXES ON TRANSPORT FUELS (KSH PER LITRE)**

	Gasoline **	Gas Oil
Excise duty	19.51	8.24
Road maintenance levy	9.00	9.00
Railway development levy (1.5% on import CIF)*	0.95	1.02
Petroleum regulatory levy	0.05	0.04
Petroleum development levy	0.40	0.40
Import declaration form duty (2.25% on import CIF)*	1.43	1.53
Remission duty	0.45	0.30
Total tax (net of railway development levy and import declaration form)	29.42	18.00
Total present tax	31.79	20.53
Average 2013 pump price	113.37	107.34

Source: Petroleum Institute of East Africa.

\* Estimates: based on CIF refined gasoline and diesel values (July 2013 Platts): US\$1,015.5 per metric ton (gasoline) and US\$ 938 per metric ton (diesel).

\*\* Premium Motor Spirit (MSO) fuel.

\*\*\* Energy Regulatory Commission (ERC) pump prices data (averaged over main towns). KSh per US\$ exchange rate: 86.120 (World Bank average exchange rate for 2013).<sup>36</sup> See Annex 2 below for further details of the various components of the prices.

2013, representing about 28 per cent of the retail price. For diesel, the amount was KSh 20.53 per litre (US\$ 0.24), or 19 per cent of the pump price, and is about 10 per cent lower than gasoline. There is no VAT on fuels.

### Corrective tax

Taxes are corrective when their burden corresponds precisely to the amount of externalities deriving from their production and consumption, making them efficient (Pigouvian) taxes. For all fuels, there are two kinds of externalities: (a) global damages linked to emissions of greenhouse gases; and (b) damages from local air pollution deriving from emissions of other gases, such as nitrogen oxide (NO<sub>x</sub>), sulphur

dioxide (SO<sub>2</sub>), volatile organic compounds (VCO) and particulate (PM), which all have a negative impact on human health. In the case of transport fuels, there are three additional categories of externalities: (a) traffic congestion leading to delays; (b) traffic accidents; and (c) road damages. The determination of corrective taxes requires two separate steps, namely: (a) assessing the economic value of these external costs, and (b) translating their value into an efficient tax.

Table 12 – derived from IMF 2014c – shows the full corrective tax and makes a distinction between *global* and *local* damages. A formal specification of the analytical approach used to determine a corrective tax is presented in Annex 1.

**TABLE 12. SIZE OF FULL CORRECTIVE TAXES INTERNALIZING THE GLOBAL AND LOCAL EXTERNALITIES OF TRANSPORT FUELS**

Transport fuels	Global damages (1)	Local damages (2)	Corrective tax (1+2)
<i>Diesel/gasoline</i>			
Fuel-specific externality (US\$ per litre)	0.095	0.231	0.326
Fuel-specific externality (KSh per litre, at market exchange rate)	8.177	19.912	28.089
<i>Gasoline</i>			
Fuel-specific externality (US\$ per litre)	0.083	0.367	0.450
WB average exchange rate (KSh per US\$ 2,013)	86.120	86.120	86.120
Fuel-specific externality (KSh per litre, at market exchange rate)	7.165	31.621	38.786

Source: IMF (2014c) for tax and World Bank for exchange rate (KSh per US\$ average exchange rate 2013)

### 4.3. REFORM SCENARIOS

For gasoline, the present burden is US\$ 0.37 per litre compared to a full corrective tax of US\$ 0.45 cents. For diesel, the tax burden is about US\$ 0.24 against a corrective tax of US\$ 0.33. Thus, there is some room for reform. Three scenarios are considered below, as well as in Table 13.

In the first scenario, the level of taxes on gasoline and diesel is brought to the level that completely corrects for global and local pollution and other externalities. This scenario implies a tax on gasoline of US\$ 0.450 per litre and of US\$ 0.326 per litre on diesel, corresponding to an increase of the tax burden of US\$ 21.6 per cent for gasoline and of US\$ 37.5

for diesel. Clearly, the impact of the price on diesel is much higher than that on gasoline because of the current low tax rate on diesel (see Table 14). The difference between the actual tax and the proposed full corrective tax for both diesel and gasoline derives mostly from the weight of damages from accidents which, in turn, influence the overall burden of the corrective tax for gasoline.

In the second scenario, the level of taxation on gasoline and diesel is brought to the level that corresponds to 90 per cent of full corrective taxes. The new tax would be US\$ 0.41 for gasoline and US\$ 0.29 for diesel. The increase in price, at 10.8 per cent for gasoline and 20.8 per cent for diesel, is also lower by a factor of 0.9.

**TABLE 13. PROPOSED LEVELS OF CORRECTIVE TAX ON TRANSPORT FUELS ACCORDING TO THE THREE SCENARIOS**

	Present tax	Proposed tax Scenario 1	Percentage change	Proposed tax Scenario 2	Percentage change	Proposed tax Scenario 3	Percentage change
	US\$	US\$		US\$		US\$	
Gasoline	0.37	0.45	21.6	0.41	10.8	0.37	–
Diesel	0.24	0.33	37.5	0.29	20.8	0.27	12.5

Source: Authors' calculations on data on taxes, in US\$ per litre, from PIEA, Petroleum Institute of East Africa. See: [http://www.petroileum.co.ke/index.php?option=com\\_content&view=article&id=54&Itemid=113](http://www.petroileum.co.ke/index.php?option=com_content&view=article&id=54&Itemid=113)

The third scenario that can be considered as the minimum threshold of reform consists of reducing the existing imbalance between gasoline and diesel, where gasoline is taxed more heavily than diesel. More precisely, in this scenario the level of taxation on gasoline is left untouched, whereas the level of tax on diesel is brought to the same level as gasoline, from the full corrective tax. The tax on gasoline

remains at the present level of US\$ 0.37, while the tax on diesel is increased to US\$ 0.27, the latter implies an increase of 12.5 per cent.<sup>37</sup>

Table 14 shows the impact on consumption and revenue collection of the reform, with reference to two values for elasticity drawn from the literature (Dahl, 2012).

**TABLE 14. IMPACT ON CONSUMPTION AND REVENUE COLLECTIONS OF FUEL REFORM**

Scenario	1	1	2	2	3
	Gasoline	Diesel	Gasoline	Diesel	Diesel
Present tax and levies (KSh per litre)	31.79	20.53	31.79	20.53	20.53
Price (KSh per litre)	113.4	107.3	113.4	107.3	107.3
New tax (KSh per litre)	38.8	28.1	34.9	25.3	23.02
New price (KSh per litre)	120.37	114.9	116.48	112.1	109.8
Percentage increase of price	6.2	7.0	2.7	4.4	2.3
Elasticity to price (short term)	0.26	0.13	0.26	0.13	0.13
2013 consumption (million litres)	1,051	1,799	1,051	1,799	1,799
Consumption after new tax (million litres)	1,033.7	1,782.6	1,043.1	1,788.7	1,793.7
Percentage change in consumption and damages	-1.60	-0.91	-0.71	-0.57	-0.30
Estimated tax collections before tax reform (in millions of KSh)	33,398	36,936	33,398	36,936	36,936
Additional tax collections (in millions of KSh)	6,696	13,137	3,005	8,284	4,355
Percentage increase of tax collections	20.0	35.6	9.0	22.4	11.8
Elasticity to price (long term)	0.78	0.49	0.78	0.49	0.49
Percentage change in consumption and damages	-4.8	-3.4	-2.1	-2.2	-1.1
Additional tax collections (in millions of KSh)	5,388	11,856	2,483	7,559	4,009
percentage increase of tax collections	16.1	32.1	7.4	20.5	10.9

Source: Authors' calculations based on Tables 13 and 14. Transport fuel consumption data derived from Kenya Statistical Office (2014).

The impact of the correction on consumption would vary, according to the proposed scenarios, from -1.6 to -0.3 per cent. This is the short-term impact and the result of an immediate reaction by consumers

to the change in price. In the short-term elasticity scenario, the impact on tax collections would be quite substantial, amounting to an increase of between 20 and 9 per cent for gasoline and between 36 and

12 per cent for diesel (see Table 14). This projected change derives from a tax increase that is made substantial in percentage terms by the low level of current taxation on gasoline.

The long-term<sup>38</sup> impact, allowing for adjustment of vehicle size and efficiency, driving habits and location of residence, is expected to be about three times higher; the impact becomes substantial because of the larger value of the long-term elasticity (almost four times in the case of diesel) (Graham D.J., Glaister S., 2002; Cooke et al., 2014; Coady et al., 2006, 2010). An estimate of changes in consumption and additional tax collections in the long-run elasticity scenario is presented in Table 14. The long-term reduction of consumption, and hence externalities, will be much higher, ranging from -4.8 per cent for gasoline to -3.4 per cent for diesel in the fully corrective scenario. Additional tax collections would be 4 percentage points lower than in the case of the short-term impact for gasoline, and 3.5 percentage points lower in the case of diesel.<sup>39</sup>

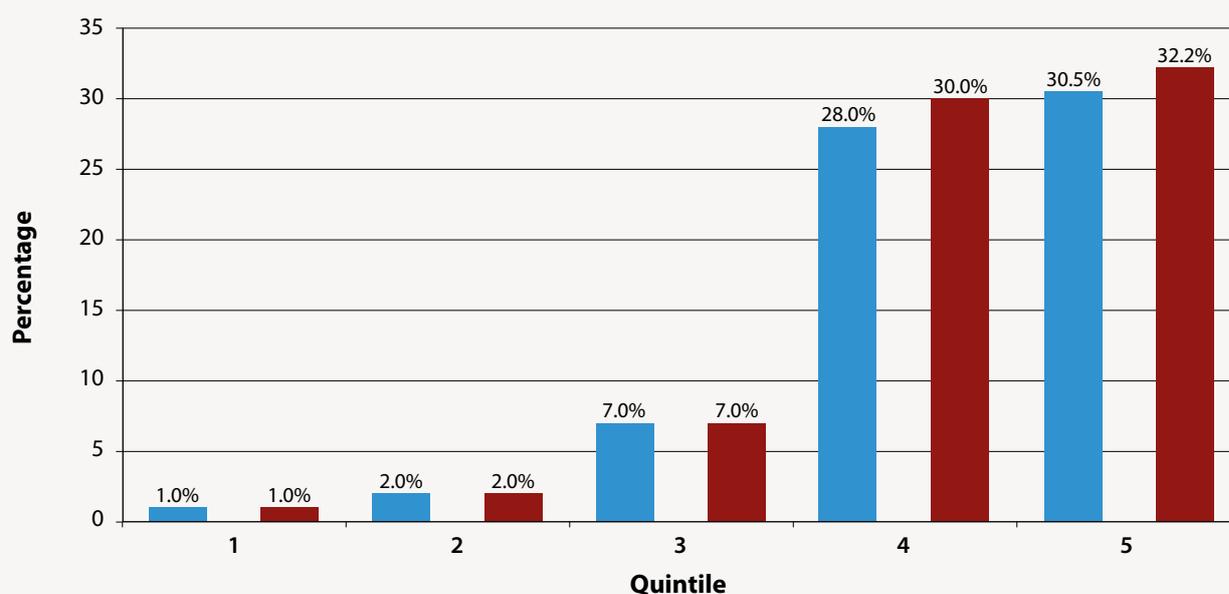
If we assume a sustained and sizeable increase in price, which has been extended enough for long-term effects to be fully realized, consumers would respond more to the price reforms as they have more time to make choices which need a longer time span.<sup>40</sup>

#### 4.4. CORRECTIVE TAX ON TRANSPORT FUELS: DISTRIBUTIVE IMPACT OF REFORM AND ITS COMPENSATION

As in the case for most countries, Kenya does not carry out household budget surveys every year, and information from the most recent available survey (KHBS, 2005) is out of date. However, updated data can be approximated by converting expenditure data from the 2005/06 survey to the 2013 reference year. More precisely, values for 2013 were obtained by multiplying the 2005/06 survey data on per capita household final consumption expenditure by the percentage increase from the base year to 2013. Final consumption data were taken from the World Bank Development database (2014 revision). This method accounts for both inflation and real growth in household consumption, as well as population increase.<sup>41</sup>

Figure 4 reports the share of expenditure for transport fuel on total consumption expenditure before and after the reform of transport fuels. The profile of the distribution before (1) and after (2) reform is highly progressive, with a disproportionately high share of fuel consumption concentrated in the upper quintile. From a welfare perspective, this implies that the proposed reform will impact more heavily on the richest quintiles.

**FIGURE 4. SHARE OF TRANSPORT FUEL EXPENDITURE IN TOTAL HOUSEHOLD CONSUMPTION EXPENDITURE PER QUINTILE BEFORE AND AFTER REFORM IN 2013\***



Note: budget shares calculated on quintiles based on monthly per capita expenditures.

Source: Authors' estimates based on KHBS (2005).

\* Reform scenario 1 (column 1 and 2 in table 15)

A caveat to be noted is the effect of price increases on middle – and to a larger extent, upper quintile households – has been calculated by averaging expenditure in all households included in the survey. However, if we restrict the analysis to the households that effectively purchase fuels, the share of transport fuels on total expenditure also becomes significant for the bottom quintiles, ranging from 9 per cent for the bottom quintile

to 12 per cent for the third quintile. Under this scenario, there could be a relevant welfare loss for the bottom quintiles.

Measures to mitigate the impact of transport fuel price increases are critical to ensure the success of the reform. Different tools may be appropriate to compensate households for the welfare loss (see Box 3).

## Box 3.

# Instruments for compensating poor households

One option for compensation is unconditional cash transfers. Ideally, transfers should be targeted to the poorest households. However, assessing eligibility is a problem which explains the prevalence of non-targeted transfers. An example of targeted unconditional cash transfers is Indonesia's "Bantuan Langsung Tunai" introduced to compensate the impact of the gradual reduction of environmentally harmful subsidies (which has resulted in increased fuel prices) on the poorest households. This programme pays unconditional monthly cash payments to poor households. A total of 19.2 million households, representing 35 per cent of the population, were included in the programme. It is considered to have not only helped the poor, but also contributed to preventing near-poor households from entering poverty (Beaton and Lontoh, 2010).

Another compensation option is conditional cash transfers. For example Brazil's *Bolsa Família* programme is a Brazilian social welfare programme, which forms part of a larger basket of federal assistance programmes. *Bolsa Família* provides financial aid to poor Brazilian families with dependent children. Families have the obligation of sending children to school and to have them vaccinated. In 2006, *Bolsa Família* was estimated to cost about 0.5 per cent of Brazil's GDP and about 2.5 per cent of total government expenditure. It covered about 11.2 million families, or about 44 million Brazilians (Lindert et al., 2007). The programme is widely considered to have achieved its objectives.

In Kenya, there is limited but encouraging experience with cash transfers that have used an innovative mobile payment system. For example, the recent unconditional cash transfer programme administered by an American nongovernmental organization (GiveDirectly) to protect poor families in rural Kenya (Haushofer and Shapiro, 2013). Households were eligible for this programme if roofs were built with non-solid materials (mud, grass, etc.). In the Rarieda district of Kenya, GiveDirectly identified 1,000 eligible households and, within target villages, 500 eligible households were then randomly assigned to receive unconditional cash transfers. Transfers were paid randomly to both women and men in the form of a single lump sum transfer of KSh 25,200 (about US\$ 292.61), or monthly equivalent transfers spread over nine months. A third group was selected to receive a large sum, with 137 households each given an additional KSh 70,000 (about US\$ 812.82) in seven monthly instalments of KSh 10,000 each (US\$ 116.11).

The programme was subsequently found to have been successful in increasing consumption levels and food security. The exceptional mobile money diffusion system in Kenya was a key ingredient of the success of the programme. Expanded use of mobile phone-based transfer services seems promising for improving targeting capacity. The Government of Kenya's decision to implement biometric registration for all citizens aged 12 and older is another tool for delivering cash transfers securely and efficiently. This programme should help to prevent the duplication and mismanagement of funds for social services and improve the targeting of compensation measures.

Sources: Lindert et al. (2007); Haushofer and Shapiro (2013); and Beaton and Lontoh (2010).



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The additional revenues raised from the proposed transport fuel tax reform (see Table 14) could also be used to finance compensation measures to absorb the direct and indirect impact of price increases on the poorest households. Ideally, only the poorest households should be compensated. However, one has to take into account that targeting is quite difficult for administrative reasons. As discussed, Kenya has strong potential to improve the targeting of mitigating measures. Also, political obstacles are to be taken into account since the price of fuels is a sensitive issue and those who consume more fuels are likely to strongly resist price increases. Hence, the final cost of compensation could be higher than our estimation (presented in Table 15), depending on political circumstances that cannot be fully taken into account in this study.

The study provides estimates of various combinations of compensation options. Reasonable levels of compensation, where reasonable means targeting only the poorest and less wealthy segments of the population. More precisely, four schemes are considered:

- Scheme 1 fully compensates households in the first and second quintiles, and partially (50 per cent of the increase of expenditure) households in the third quintile.

- Scheme 2 fully compensates households in the first, second and third quintiles.
- Scheme 3 fully compensates the first, second and third quintile and up to 50 per cent of the fourth quintile.
- Scheme 4 fully compensates all quintiles except the highest (fifth quintile).

Two distinct effects are considered. The first is the direct impact on household budgets (first order effect); the second is the indirect impact due to an increase in prices of all other goods and services as producers pass on higher fuel prices. The total impact is the sum of direct and indirect effects and is reported in the last column. As for the magnitude of the indirect effect, we rely on the results of the empirical literature showing that the indirect impact is about three times higher than the direct impact.<sup>42</sup> As a matter of fact, due to the small share of money spent by households on transport fuels, the main effect is indirect.

The figures shown in Table 15 present the amount of compensation needed according to scenario 1 (columns 1 and 2). Compensation costs range from KSh 31.7 million (US\$ 0.37 million) (first scheme) to KSh 352.2 million (US\$ 4.09 million) (fourth scheme). The total cost of compensation in the first scheme represents 0.2 per cent of additional tax

**TABLE 15. COST OF COMPENSATION FOR TRANSPORT FUELS ACCORDING TO THE FOUR SCHEMES (IN MILLIONS OF KENYAN SHILLINGS)**

	Direct costs	Indirect costs	Total costs
Scheme 1: compensation scheme targeted to totally compensate Q1, Q2 and -partially- Q3	7.91	23.74	31.66
Scheme 2: compensation scheme targeted to totally compensate Q1, Q2 and Q3	13.50	40.50	54.01
Scheme 3: compensation scheme targeted to totally compensate Q1, Q2, Q3 and partially Q4	50.78	152.35	203.13
Scheme 4: compensation scheme targeted to totally compensate Q1, Q2,Q3, Q4	88.06	264.19	352.25

Source: Authors' calculations on data contained in Table 14.

collections, the second scheme 0.3 per cent and the third slightly more than 1 per cent. The fourth scheme, with a higher cost, is about 2 per cent of additional tax collections. These amounts absorb a small share of additional tax collections after reform, leaving ample space for financing green investment out of increased collections.

#### 4.5. RESIDENTIAL USES: A CORRECTIVE TAX ON KEROSENE

##### Present taxation

In Kenya, taxation of kerosene is currently very low. The total burden is made of various small levies shown in Table 16, which represent about 4.1 per cent of the per litre retail price of kerosene.<sup>43</sup>

This very low level of taxation aims to ensure universal access to kerosene, which is used primarily for lighting and cooking. In particular, given the

role played by kerosene fuel for lighting in rural and remote areas, the low level of taxation is aimed at protecting households living in those areas where access to electricity is minimal or absent (Lighting Africa, 2011).

An increased tax on kerosene is expected to alter existing incentives towards the use of more environmentally friendly energy products and to contribute to generating fiscal space that could be employed to subsidize alternative technologies (e.g. solar or wind small-scale power plants and LNG feeder lamps) or support investments to facilitate access to the electricity grid.

Recent empirical estimates on energy consumption patterns in Kenya (Kippra, 2010 and Ngui et al., 2011) show that the cross price elasticity of kerosene versus LPG is positive. This means that income effects outweigh substitution effects, and also that a simple increase in income will not induce households to spend more on other fuels. This confirms that the

**TABLE 16. TAXATION OF KEROSENE FOR DOMESTIC USES (KENYAN SHILLINGS PER LITRE)**

	Illuminating Kerosene (IK)
Average 2013 pump price	82.55
Railway development levy*	1.00
Petroleum regulatory levy	0.05
Petroleum development levy	0.40
Import declaration form duty* *(%)	1.50
Remission duty	0.45
Total tax	3.41

Source: Petroleum Institute of East Africa (PIEA).

\* Estimates based on CIF kerosene price 123.35 US\$ per barrel (July 2013 Platts).

impact of cross-price elasticity does not determine the choice of alternative fuel.

Switching to cleaner and more efficient lighting and cooking devices requires investment. Small-scale programmes, such as the Kibera electrification programme in 2007, has proved successful in connecting new customers in poor areas to the electricity grid, although the cost for each connection has been substantial (UN-Habitat, 2010). Under this programme, the economic viability of low-income households connecting to the grid was assured. Ten thousand new customers were targeted for a total

expenditure of US\$ 2.25 million in current terms, of which 60 per cent was paid by POBA and IDA and 40 per cent by KPLC.<sup>44</sup> Similar conclusions could be drawn from international experience.<sup>45</sup>

### Corrective tax

A corrective tax burden on kerosene would reflect the externalities deriving from household consumption with global and local damages translated into an efficient tax. Table 17 reports the estimates for Kenya of a corrective tax for global and local damages for kerosene.<sup>46</sup>

**TABLE 17. CORRECTIVE TAX INTERNALIZING GLOBAL AND LOCAL EXTERNALITIES OF KEROSENE FOR DOMESTIC USES**

	Full	Global	Local
Fuel-specific externality (US\$ per Gj)	2.642	2.499	0.143
WB average exchange rate (KSh per US\$ 2013)	86.12	86.12	86.12
Fuel-specific externality (KSh per Gj, at market exchange rate)	227.53	215.22	12.30

Source: Authors' estimates based on data reported in Annex 3, IMF (2014c) and World Bank (market exchange rates)



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In contrast to transport fuels, local externalities have a low weight on total corrective tax as congestion costs do not apply and accidents should be much lower. The main component is global damages (US\$ 2.6 per Gj). In the case of transport fuels, local damages for gasoline and diesel are mostly due to congestion and accident costs, which do not apply to kerosene.

As for harmful indoor particulate emissions from kerosene (mainly used for lighting devices), there is no scientific agreement on intake fractions in real world situations. As noted by Lam et al. (2012), no study has reported personal exposure or environmental concentrations from field-based measurement aimed at quantifying the effects of lightning on indoor air quality in non-laboratory experiments. Quantitative data taken from real-world analysis is needed to model corrective taxes for local damages from kerosene indoor consumption.

Assessing kerosene for lighting devices quality thus seems of primary importance.

#### 4.6. REFORM SCENARIOS: IMPACT ON CONSUMPTION, POLLUTION AND REVENUE

Table 18 shows simulations of the impact on aggregate consumption and revenue collections of the proposed corrective tax on kerosene. Two different scenarios are calculated. The first is aimed at a full correction of externalities (global and local) and the second is aimed at only correcting global externalities. They use two different elasticity parameters taken from the literature (Rao, 2012). The first one is a conservative elasticity parameter, based on the hypothesis that kerosene consumption is highly inelastic (parameter 0.1) and that consumers cannot switch to other fuels in the short-

**TABLE 18. ENVIRONMENTALLY EFFICIENT TAX ON KEROSENE: SIMULATION OF REFORMS INTERNALIZING ENVIRONMENTAL EXTERNALITIES PARTIALLY AND FULLY**

	Internalization of global damages only	Full internalization of damages (global and local)	Internalization of global damages only	Full internalization of damages (global and local)
	elasticity 0.1	elasticity 0.1	elasticity 0.25	elasticity 0.25
Present tax and levies (KSh per litre)	3.41	3.41	3.41	3.41
Price (KSh per litre)	82.55	82.55	82.55	82.55
First reform step: adjustment for global damages (KSh per litre)	6.11	7.95	6.11	7.95
New price (KSh per litre)	85.25	87.09	85.25	87.09
Percentage increase of price	3.3	5.5	3.3	5.5
Elasticity to price	0.1	0.1	0.25	0.25
2013 consumption (million liters)	362	362	362	362
Consumption after new tax (in millions of litres)	361	360	359	357
Percentage change in consumption	-0.3%	-0.5%	-0.8%	-2.2%
Estimated tax collections before tax reform (in millions of Kenyan shillings)	1,235	1,235	1,235	1,235
Estimated tax collections after first step of reform (in millions of Kenyan shillings)	2,208	2,864	2,197	2,841
Additional collections (in millions of Kenyan shillings)	973	1,628	961	1,605
Percentage increase of tax collections	79	132	78	130

Source: Authors' calculations based on Tables 16 and 17. Consumption data: Kenya Facts and Figures 2014

term. The second parameter is much higher (0.25) allowing testing for the sensitivity of our analysis to an increase of elasticity. We assume that the more elastic parameters found in the literature measure full substitution effects and represent long run elasticities. Low elasticity parameters are suggested by the consideration that kerosene for lighting and cooking is a basic resource and kerosene users, especially kerosene lighting users, have no readily accessible alternative energy sources, at least in the short-term. According to our estimates (Table 18) consumption of kerosene after tax would decrease only by 0.6 per cent. The mean annual consumption of kerosene before and after tax reform is shown in Table 20 according to a low and high elasticity scenario.

The full internalization of global and local externalities leads to a moderate increase in price of +5.5 per cent and a large increase of collections of more than 130 per cent for all elasticity values. In the case of the global correction only, the price increase is lower but always significant: + 3.3 per cent and the additional collections are five times higher than the pre-reform collections. Additional revenues range from KSh 961 million (US\$ 11.16 million) to KSh 1.6 billion (US\$ 0.02 billion), according to the level of correction proposed.

### Corrective tax on kerosene: the distributive impact of reform and its compensation.

The share of household expenditure for kerosene is shown in Figure 5. The overall profile is similar to that of other less-developed countries (Bacon et al., 2010). Consumption of kerosene increases with household income (Table 19), however the share of expenditures in household budgets show a slightly regressive profile.

**TABLE 19. PER CAPITA KEROSENE EXPENDITURE AND CONSUMPTION BY QUINTILE IN 2013**

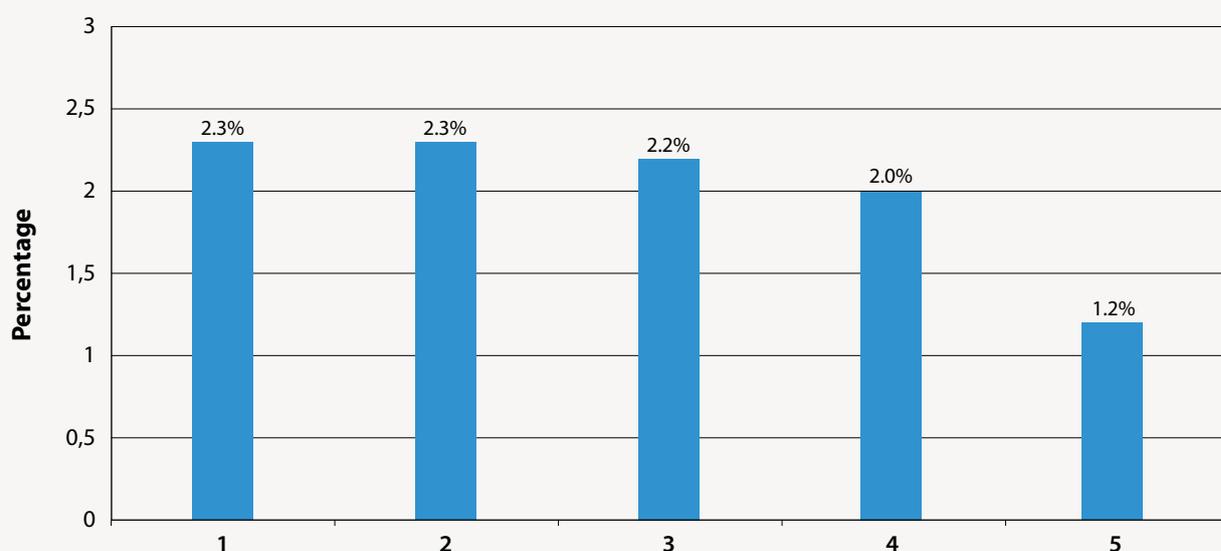
	Kerosene mean annual expenditure (KSh)	Litres per year*
Q1	326	4
Q2	603	7
Q3	902	11
Q4	1 306	16
Q5	2 205	27
Total	1 068	13

Source: Calculations based on KHBS (2005).

\*Assuming that the kerosene reference price is the same as the one shown in Table 16.

The mean annual per capita expenditure for kerosene (Table 19) is KSh 1,068 (US\$ 12.40). It ranges

**FIGURE 5. ESTIMATE OF SHARE OF KEROSENE EXPENDITURE ON TOTAL HOUSEHOLD CONSUMPTION EXPENDITURE PER QUINTILE (2013)**



Note: budget shares calculated on quintiles based on monthly per capita expenditures. Data derives from updating of KHBS (2005).

from KSh 326 (US\$ 3.79) for the first quintile to KSh 2,205 (US\$ 25.6) in the upper quintile showing a quite marked progressivity of consumption. In physical terms, kerosene use ranges between 4 litres per capita per year in the bottom quintile and 27 litres per capita per year in the upper quintile.

Table 20 reports the actual expenditure before and after the reform, taking into account the impact of elasticity. The four columns on the right report the expenditure needed for the same level of consumption with reference to the two values of elasticity. The first column reports the current

annual per capita expenditure, per quintile. The expenditure would increase for each quintile by 5 per cent with an elasticity of 0.1 and by 4 per cent with an elasticity of 0.25. Both increases are relatively low, which also implies a modest cost of compensation in general.

Table 21 reports the cost of four different compensation schemes. Scheme 1 fully compensates households in the first and second quintiles, and partially (50 per cent) compensates households in the third quintile. Scheme 2 fully compensates households in the first, second

**TABLE 20. MEAN ANNUAL PER CAPITA KEROSENE EXPENDITURES PER QUINTILE BEFORE AND AFTER TAX CHANGES<sup>47</sup> (IN KENYAN SHILLINGS)**

Quintiles	Actual expenditure	Expenditure after reform correction for global damages		Expenditure after reform correction for all damages (global and local)	
		elasticity of 0.1	elasticity of 0.25	elasticity of 0.1	elasticity of 0.25
Q1	326	335	334	342	339
Q2	603	621	618	633	627
Q3	902	928	924	946	938
Q4	1,306	1,344	1,337	1,370	1,359
Q5	2,205	2,270	2,259	2,314	2,295
Total	1,068	1,100	1,094	1,121	1,111

Source: calculations based on KHBS (2005)



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and third quintiles. Scheme 3 fully compensates households in the poorest quintile and partially (50 per cent) compensates households in the second quintile. Finally, scheme 4 fully compensates only the first and second quintiles.

The compensation schemes for kerosene do not incorporate the indirect impact of price increases per unit of fuels, as kerosene is a final use for households.<sup>48</sup> In the most ambitious scheme, with a fully corrective tax and considering an elasticity parameter of 0.1, compensation ranges

from KSh 562 million (US\$ 6.53 million) (totally compensating the bottom quintile and partially compensating the second) to approximately KSh 1.6 billion (US\$ 0.02 billion), fully compensating first, second and third quintiles (column 3 in Table 21, scheme 2). These amounts would absorb a substantial share of additional collections from the reform in the first case (34.5 per cent). In the case of total compensation of the first, second and third quintiles, applying a fully corrective tax, the cost is approximately equal to the total additional revenues from the reform.

**TABLE 21. COST OF COMPENSATION FOR KEROSENE ACCORDING TO THE FOUR SCHEMES (IN MILLIONS OF KENYAN SHILLINGS)**

	After correction for global damages (elasticity 0.1)	After correction for global damages with elasticity of 0.25	After correction for all damages with elasticity of 0.1	After correction for all damages with elasticity of 0.25
<b>Scheme 1:</b> compensation scheme targeted to totally compensate Q1, Q2 and -partially- Q3	738	611	1,236	1,017
<b>Scheme 2:</b> compensation scheme targeted to totally compensate Q1, Q2 and Q3	980	810	1,640	1,350
<b>Scheme 3:</b> compensation scheme targeted to totally compensate Q1, and partially Q2	336	277	562	463
<b>Scheme 4:</b> compensation scheme targeted to totally compensate Q1, and Q2	497	411	832	685

Source: Authors' calculations based on tables 19, 20 and 21



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## 5 CONCLUSION

Financing investments in energy programmes and enhanced environmental infrastructure are among the key priorities for ensuring a successful green economy transition in Kenya. Yet, financing these investments represents a huge budgetary challenge in view of the stringency of the financial situation of the public sector in Kenya. In addition, Kenya recently embarked on an ambitious process of administrative and fiscal decentralization which requires expanded tax revenues at the central and subnational level to finance the process.

Against this backdrop, this study analyses the existing fiscal space for financing green economy investments in Kenya and how additional fiscal space can be created through the strategic use of revenues generated from future oil exploration and through energy tax reforms. To avoid creating an excessive burden on central government finances and to increase accountability of the counties, the study also suggests that subnational governments need to rely more on their own sources of revenue.<sup>49</sup>

With recently discovered oil reserves in Turkana county, Kenya will be an oil producing country by 2018. While uncertainty still surrounds the effective volume of production, there is a need to set up an adequate legal and fiscal framework for oil exploration and exploitation, which includes decisions on the efficient and equitable use of oil revenue.

According to preliminary estimates, revenue accruing to the government from oil exploration and exploitation could fluctuate between US\$ 600 and US\$ 1,000 million per year for a 30-year period. This would amount to about 6-10 per cent of present central government revenue.

The use of this additional revenue requires careful consideration. Two of the options discussed in the study, namely the SWF and intergovernmental sharing, are already in the current legal discipline. However, they require more detailed regulation before they can be implemented. In particular, given the process of decentralization, discussion on

how to design intergovernmental sharing is timely and deserves careful thinking. The study suggests a revision to intergovernmental sharing which aims to allocate oil revenues to subnational governments in oil producing areas on the basis of costs for the provision of oil-related infrastructure and services, as well as compensating for any environmental damages from oil production. The study also questions the viability of the SWF as much higher annual deposits than the currently mandated minimum of 5 per cent are needed when taking into account administration costs. However, high deposit shares would also conflict with the needs of the present generation and thus require further analysis.

Some options which have not yet been considered, but are worth further discussion are elaborated in the study, namely, a Stabilization Fund, direct cash transfers to individuals, and a special fund for environmental projects and related investments. A Stabilization Fund is strongly recommended in view of the oscillations of oil revenue and can be introduced alongside other options. Direct cash transfers could be considered if oil revenues are misspent or lead to flagrant cases of corruption. Another option discussed in the study is the reorientation (and relabelling of the SWF) into a special fund for environmental projects (i.e. a Green Sovereign Fund) which can be used to channel revenues to environmental protection, technology, or green growth investments.

The study also explores the need to reform taxes on energy products. The suggested reforms in the study focus initially on gasoline, diesel and kerosene. A tax correcting for global and local damages produced by fossil fuels used for transportation would provide an additional 0.5 percentage points of collections on GDP<sup>50</sup>, representing an increase of about 28 per cent over revenues in 2013 (almost 2 per cent of GDP). Reforming kerosene taxation to fully internalize environmental and health damages would provide about 0.08 per cent of GDP, representing a substantial increase compared to the current level of taxation (0.01 per cent of GDP). These tax reforms will have a direct impact on individuals and firms

through the internalization of social damages in the price of fossil fuels, while also creating fiscal space for green investment.

The suggested reforms to fiscal policies outlined in this study cover a broad range of sectors and areas, including reformed local taxes, options for the use

of revenues from oil exploration and exploitation and reforms to the system of fossil fuel taxation. The revenues generated from such reforms could be used not only to further fiscal policy reforms overall but also to mobilize additional resources for investment in key priority areas, thereby advancing Kenya's green economy pathway.

## 6 ANNEXES

### ANNEX 1 EXTERNALITIES DERIVING FROM THE PRODUCTION AND CONSUMPTION OF PETROLEUM PRODUCTS INCLUDE THE FOLLOWING:

#### Global damages

Global damages are the sum of a large number of impacts deriving from greenhouse gas (GHG) emissions, such as on: agricultural production; water availability; marine ecosystems; sea-level rise; increased frequency and gravity of natural disasters; the spread of tropical diseases and biodiversity loss. Existing estimates of such damages reflect divergent views on crucial factors, such as the discount rate, the valuation of ecosystem damages and the probability of occurrence of extreme disasters. The location of countries is also an important determinant of damages, as well as the structure of their economic system. Developed countries situated in temperate zones may even benefit from global warming as a result of reduced heating needs or increased agricultural output, albeit only in the near future. Small island states situated in tropical zones are however likely to be the most severely hit by higher frequency of hurricanes and increased sea levels.

On the infrastructure side, valuations include costs related to prevention, restoration and protection-related activities. Damages also include the value of lost production and lives. For example, the costs associated with sea-level rise are the sum of capital costs of protecting coastal areas plus the value of land and infrastructure at risk, as well as expected fatalities evaluated using the statistical value of life. Clearly, there is wide room for discretion in the selection of factors and prices. As with all long-term phenomena, the choice of discount rate exerts a critical influence and generates widely divergent values. However, at the beginning of the 21<sup>st</sup> century the central value for damages to developed countries was around US\$ 20-22 per ton of CO<sub>2</sub> emissions. This corresponds to a cost of about US\$ 6 cents per gallon of fuel. Such a value has been subsequently re-evaluated following growth of GDP, inflation, and a

better appreciation of the environmental impacts of climate change. IMF (2014) tentatively suggests that the per ton value of CO<sub>2</sub> emissions is US\$ 35.

#### Local environmental externalities

The first step in the valuation of local environmental effects is to assign emissions of different pollutants to the use of each fossil fuel. This requires disaggregated information on fuel consumption. The next step is to estimate the impact of each fossil fuel on the deterioration of air quality, which in turn damages human health, depending on exposure levels. The usual methodology for evaluating these damages related variations in the concentration of pollutants to its likely impact on health.

Converting health impacts into economic values is based on mortality and morbidity values (Navajas et al., 2012:12-13). The evaluations based on the value of a statistical life are based on foregone future incomes, but the subjective value people assign to life, in terms of consumption and leisure, is not considered.

#### Congestion

Estimation of congestion costs is based on delays, concentrated in the urban areas, and the value of time. Damages caused by congestion in terms of higher emissions due to expanded consumption of fuels should also be added to get a full estimate of local environmental externalities.

#### Accidents

Costs of accidents depend mainly on rates of accidents, injuries and the value of life. To this, medical costs and damages to property have to be added. To estimate the cost for Kenya, the authors used parameters calculated in IMF (2014).

## Road damages

Road damages depend on the use of roads by heavy vehicles, e.g. lorries which mostly use diesel. Estimates for road damages consequently refer only to the use of diesel.

### A corrective tax on transport fuels: methodology

The analytical approach proposed in Parry and Small (2005) is used to translate damages into corrective taxes, as shown in the formula below.

$$t_p^* = CE + LE * mg * \alpha \quad (1)$$

Where  $t_p^*$  is the optimal Pigouvian tax the first factor; CE are global damages and are linked directly to consumption of fuels; LE are local damages that are considered to be proportional to the number of miles driven rather than to fuel

consumption. There are two reasons for the link with miles driven instead of fuel use. First, there is the impact of emissions standards, which are defined in terms of grams per mile, rather than grams per gallon. This means that a vehicle with low miles per gallon will not pollute more per mile since it has to comply with emissions standards. Second, miles per gallon,  $mg$ , will also rise with higher fuel prices since people will respond by purchasing smaller or more energy efficient vehicles.

This formula scales back the mile-related cost of externalities by applying a factor  $\alpha$  reflecting the reduction at the margin in fuel consumption due to the decrease in miles driven because of increased taxation. The factor  $\alpha$  represents an impact that is added to the reduction in fuel consumption deriving from improvements in the average fuel economy of vehicles. The authors adopt a value of 40, as in Parry (2005) for this parameter.

## ANNEX 2 TAXATION COMPONENTS ON DIESEL AND GASOLINE

*Excise duty* of KSh 19.51 (US\$ 0.23) for gasoline and KSh 8.2 (US\$ 0.09) for diesel

*Petroleum regulatory levy*: KSh 0.05 per litre of gasoline and KSh 0.04 for diesel

*Uniform road maintenance levy* of KSh 9 (US\$ 0.10), introduced in 1993 to provide adequate funding to road network maintenance operations

*Petroleum development levy*: uniform levy of KSh 0.4

*Railway development levy*, equal to 1.5 per cent on all imports. This was, introduced in 2013 and aimed at supporting railway network financing

*Remission duty*: KSh 0.45 for gasoline and KSh 0.3 for diesel

*Import declaration fee* equal to 2.25 per cent on all imports

## ANNEX 3 DETERMINATION OF EMISSIONS CONTENT FROM USE OF KEROSENE

For kerosene, the authors use the pollutants parameters taken from EMEP estimates of kerosene emissions, and health damages related to local

emissions ( $SO_2$ ,  $NO_x$  and PM).<sup>51</sup> These parameters can be found in Table 22 below.

**TABLE 22. EMISSIONS PARAMETERS USED FOR KEROSENE CORRECTIVE TAX CALCULATIONS (IN KT/PJ)**

	$SO_2$	$NO_x$	$CO_2$	PM 2.5
EMEP/EEA E.I.G. 2013	0.087	0.05	72.2	0.017

Source: Authors' calculations on European Monitoring and Evaluation Programme (EMEP) database

Emissions parameters are similar to those obtained using the GAINS<sup>52</sup> model for CO<sub>2</sub> and NO<sub>x</sub>, but higher for SO<sub>2</sub> and PM2.5. The structure of the kerosene corrective tax is illustrated in the formula below.

$$t_f^* = CE + LE \quad (2)$$

Where  $t_f^*$  is the optimal Pigouvian tax, expressed in US dollars per litre, CE are global damages (carbon emissions) and LE are local damages from pollutants and other externalities.

## ANNEX 4 PROPERTY TAXATION IN REPRESENTATIVE GROUP OF COUNTRIES

**TABLE 23: COLLECTIONS FROM PROPERTY TAX AS A SHARE OF GDP BY GROUPS OF COUNTRIES (PER CENT)**

	1970s	1980s	1990s	2000s*
All countries	0.77	0.73	0.75	1.04
(number of countries)	37	49	59	65
OECD countries	1.24	1.31	1.44	2.12
(number of countries)	16	18	16	18
Transition countries	0.34	0.59	0.54	0.68
(number of countries)	1	4	20	18
Developing countries	0.42	0.36	0.42	0.6
(number of countries)	20	27	23	29
Latin American countries	–	–	0.36	0.37
(number of countries)	–	–	8	10

\* The data for 2000s is for the 5-year period between 2000 and 2004.  
Source: Bahl, R. and Martinez-Vazquez J. (2008).



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## NOTES

1. The term “subnational government” is used in this report when referring to all government units situated below the central government. The Constitution specifically refers to counties which amalgamate previous responsibilities of local authorities, deconcentrated administrations and district administrations. Other legal documents also make reference to municipalities, villages and other local governments which are not further specified.
2. UNEP (2014), page 39.
3. IMF (2013).
4. International Monetary Fund, Kenya *Article IV consultation-Staff Report*, October 2014
5. Available at: [http://www.who.int/water\\_sanitation\\_health/publications/2012/jmp\\_report/en/](http://www.who.int/water_sanitation_health/publications/2012/jmp_report/en/)
6. These are the layers recognized by the Constitution. Other legal documents also make reference to municipalities, villages and other local governments which are not further specified. Urban areas are governed by municipalities without constitutional discipline. Villages also exist again with no precise legal status. When dealing with decentralization issues, this study specifically refers to the counties. However, when needed the study also discusses local governments which includes municipalities, villages and other local entities.
7. The newly-created counties have a county executive headed by an elected governor, responsible for implementing county and national legislation, for proposing bills, and for managing county affairs (Art.183 of Kenya’s 2010 Constitution). County Assemblies are responsible for legislation and for reviewing proposals for development programmes presented by the county executive committee (Art.185).
8. Data on international practice show that in developing countries, property tax collections accounted for about 0.5 per cent of GDP in the early 2000s. Property taxes are generally neglected in the developing world due to various political and economic factors. However, low levels of property taxes also implies that with some additional effort, their share could be substantially increased. For further information on this, please see Table 1 in Annex 4.
9. Tullow Oil press release issued on 15 January 2014. Available at: <http://www.tulloil.com/media/press-releases/operational-update-kenya-jan-2014>
10. Financial Times, 2 December 2014.
11. Africa Oil, one of the 21 companies holding exploration licences in Kenya, expects to find more than 1 trillion cubic meters of gas. If confirmed, the deposits could provide fuel for a gas-fired power plant and contribute to the Kenyan government’s ambition to add 5,000 megawatts to the grid over the next 40 months – more than double current total capacity. (Financial Times, 2 December 2014).
12. Kenya as a whole has a total land surface of 581,309 km<sup>2</sup>, and had a population of about 44 million in 2012 (Johannes, et al. 2014).
13. Kenya National Bureau of Statistics, *Kenya Economic Survey 2014*. Nairobi, 2014.
14. For more detailed discussion see Nakhle (2009 and 2010) which provides an illustration of the various fiscal instruments used to extract oil rent.
15. A recent proposal submitted to the Parliament recommends that a share of 32 per cent of oil proceeds should be allocated to the counties where exploitation will take place.
16. Tullow Oil Press Release of 21 October 2014.
17. The estimate is taken from EIA (2011) that reports a production cost of US\$

- 42 for 2006/2008 and of US\$ 45 US dollars for 2007-2009 for, respectively, onshore and offshore exploitation in Africa. Production in Kenya will be onshore, with costs about 20 per cent less than offshore exploitation. However, costs need to be updated, suggesting that the estimate of US\$ 45 indicated here is reasonable. A similar level of cost is suggested by *Reuters FACTBOX-Oil production cost estimates by country*, 28 July 2009. <http://www.reuters.com/article/2009/07/28/oil-cost-factbox-idUSLS12407420090728>
18. At the time of writing these prices may look optimistic. It is possible, however, that when this report is issued, the outlook will have changed. Predicting oil prices is near impossible due to a wide band of fluctuation of these prices.
  19. International Energy Agency, various “World Energy Outlook” and EIA (2011).
  20. The similarity is based on the present fiscal regime that the government intends to reform. It is unlikely that the reformed regime will be significantly different from the existing one in terms of the size of government take.
  21. See for example Brosio and Singh (2014) and the references therein.
  22. For data sources, see text in section 3.6
  23. See Brosio and Singh (2014), *op cit.*, for a review of issues and practice.
  24. *Ibid.*
  25. The evaluation of these costs is extremely difficult, although in principle the criterion of the opportunity costs should inform the calculation. The use of a rocky and totally inhospitable desert has an environmental impact and thus a cost that is much lower than the use of densely populated agricultural land.
  26. See “*The National Sovereign Wealth Fund Bill, 2014*” downloadable at: <http://www.cickenya.org/index.php/legislation/item/399-the-national-sovereign-wealth-fund-bill-2014#.VbSyrHjeNrM>
  27. More information on the GPFG is available at: <http://www.nbim.no/en/the-fund>
  28. More information on the FRR is available at: <http://www.bank-of-algeria.dz/>
  29. More information on the CBR is available at: <http://treasury.dor.alaska.gov/Investments/Constitutional-Budget-Reserve>
  30. More information on the APF is available at: <http://www.apfc.org/home/Content/home/index.cfm>
  31. See Hou, Yilin (2004) for an exhaustive review of these issues.
  32. Kenya continues to rank poorly in Transparency International’s Corruption Perception Index. It is currently ranked 136 out of 177 countries and territories, and its score is 27 on a scale from 0 to 100, where 0 is a highly corrupt and 100 is a very clean country. This performance makes a strong case for the use of cash transfers in Kenya.
  33. *Draft National Climate Change Framework Policy (NCCFP)*, September 2014 version.
  34. Authors’ estimates based on *Kenya Integrated Household Budget Survey- 2005/06*.
  35. Information and financial data are drawn from an AfDB report available at: <http://www.afdb.org/en/news-and-events/article/lake-turkana-wind-power-project-nominated-power-deal-of-the-year-in-2014-13886/>
  36. The ERC is responsible for regulating the electrical energy, petroleum and related products, renewable energy and other forms of energy.
  37. The ratio between proposed tax for gasoline to full corrective tax ( $37/45 = 0.75$ ) is equal to the ratio for diesel ( $27/ 33 = 0.8$ ).
  38. In this context, long term refers to a period long enough to allow for adjusting driving habits and the fleet of vehicles to a higher fuel efficiency, induced by the higher prices.

39. According to the fully corrective tax scenario for gasoline and diesel in Table 14, columns 1 and 2.
40. Automobile fleets take time to be fully substituted. The same for consumers to react to higher prices by changing residence or job.
41. As for the grouping method, we ranked households according to their per capita total expenditure. Households have been assigned to quintiles according to their per capita expenditure and each quintile has the same number of people. The consumption levels refer to average per capita expenditures.
42. The multiplier used is consistent with the results in Coady and Newhouse (2005), El Said and Leigh (2006), but slightly higher than Arze del Granado et al. (2010) for sub-Saharan countries.
43. Calculation based on 2013 average price per litre. Source: Energy Regulatory Commission (ERC) data on monthly pump prices.
44. Calculation of total costs is based on the amount of money spent to subsidize each connection (US\$ 225) and financed by Kenya Power and Lighting Company, Global Partnership on Output-based Aid, IDA and World Bank. The cost borne effectively by household for each connection was US\$ 15 and US\$ 23 for commercial premises. Normal electricity connection cost is approximately US\$ 400 (UN-Habitat, 2010).
45. Nationwide programmes to support cleaner fuels, e.g. LPG or electricity, for cooking and lighting include Senegal's Butanization Programme, which aimed to replace 50 per cent of fuel wood and charcoal with LPG in major urban areas). The programme successfully increased households LPG use via price subsidization, and resulted in LPG total consumption growing from 3,000 to 130,000 tons between 1974 and 2006. However, as the authorities recognized, the financial cost was significant (IMF, *Subsidy reform in the Middle East and North Africa* 2014). According to the IMF report *Subsidy reform in the Middle East and North Africa* (2014), LPG subsidies in Senegal reached 0.5 per cent of GDP in 1997 (about US\$ 23.3 million at the applicable exchange rate in 1997).
46. The methodology used for their determination and the analytical structure of the kerosene corrective tax is illustrated in Annex 3.
47. Higher elasticity scenario (0.25) could be considered as a relaxation of the assumption of all households reacting unelastically to increasing prices. 'Last resort' users (i.e. households with no alternatives to kerosene) cannot shift to different fuels, and they can only react unelastically to price changes; others could have few close substitutes, reacting with a higher elasticity.
48. In Anand et al. (2013), the direct impact of a price increase of fuels consumed by households for cooking, lighting and personal transport in India accounts for about three-quarters of the total welfare impact. This reflects the relatively large increases in the prices of kerosene and LPG which are mainly for cooking and lighting in India.
49. In particular, property taxes could be increased and differentiated according to environmental criteria, while cadastre and registries are centralized and strengthened. Detailing the steps needed to strengthen the system of property taxes is not within the scope of this study, however it is important to stress the urgency of such reforms. There is a need for further analysis on how property taxes can be reformed.
50. 2013 GDP data is taken from Kenya Facts and Figures (2014).
51. IMF (2014c).
52. G.A.I.N.S. (IIASA) Greenhouse Gas and Air Pollution Interactions and Synergies. Data from Gains model have been used in IMF 2014c calculations of corrective taxes for diesel and gasoline and other fossil fuels. See IIASA website: <http://gains.iiasa.ac.at/models/> and IMF (2014).





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