



**Asia-Pacific
Economic Cooperation**

PEER REVIEW ON FOSSIL FUEL SUBSIDY REFORMS IN PERU

Final Report

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FINAL REPORT

DISCLAIMER

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CONTENTS

1. Introduction and APEC FFSR Peer Review Process	I
2. Energy Subsidies	5
Fossil Fuel Subsidies	6
Lessons Learned from Fossil Fuel Subsidy Reform	7
3. Macroeconomics and Sociodemographics	9
Macroeconomic Condition	9
Sociodemographic Conditions and Social Policy	14
4. Energy Landscape of Peru	17
Energy Resources and Production	18
Energy Consumption and Demand Forecast	22
Electricity in Peru	25
National Energy Policy 2010–2040	29
5. Preferential VAT and ISC Taxes in Amazon Regions	34
History and Context	34
Key Findings on Preferential VAT	38
End Goal/Vision	39
Recommendations on Preferential VAT	39
Lessons Learned and Best Practices	40
6. Fuel Price Stabilization Fund	43
History and Context	43
Findings on FEPC	48
End Goal/Vision	49
7. Energy Fund for Social Inclusion (FISE)	55
History and Context	55
Key Findings on FISE	60
End Goal/Vision	61
Recommendations	61
Lessons Learned and Best Practices	62
8. Conclusion	65
Appendix A. APRP Meetings for IFFSR Mission, June 2014	I
Appendix B. Summaries of APRP Meetings in Lima, Peru	I
Appendix C. Peer Review Team Members	I

Illustrations

Figures

Figure 1-1. Development of Peer Review Process	9
Figure 3-1. Share of GDP by Economic Activity	9
Figure 3-2. Unemployment and Part-Time Unemployment Rates in Metropolitan Lima	11
Figure 3-3. Evolution of Total Poverty and Gross Domestic Product Per Capita	12
Figure 4-1. Fossil Fuel Demand Trends	17
Figure 4-2. Energy Matrix of Peru 2012.	18
Figure 4-3. Natural Gas Development in Peru	20
Figure 4-4. Growth of Natural Gas Use in Peru	21
Figure 4-5. Per Capita Energy Consumption by Sector	23
Figure 4-6. Energy Intensity by Sector	24
Figure 4-7. Historical and Projected Demand for Energy in Peru	24
Figure 4-8. Evolution of Capacity (Top; MW) and Generation (Bottom; GWh) at SEIN	26
Figure 4-9. Electricity Infrastructure in Peru	28
Figure 5-1. Cumulative Increase in GDP Growth, 2002–2012, by Department	37
Figure 5-2. Population and Poverty in Key Departments in the Amazon Region	38
Figure 6-1. Compensation and Contribution Mechanisms for FEPC	44
Figure 6-2. Comparison of List Prices with Price Band for Low-Sulfur Diesel	45
Figure 6-3. Flow of Funds between Participants in the FEPC	45
Figure 6-4. Evolution of Government of Peru Transfers to the FEPC, 2006 to 2013	46
Figure 6-5. Changes in Indexed World Crude Prices and FEPC Fuel Prices in 2013	47
Figure 7-1. Fuels Used for Cooking in Poor (left) and Extremely Poor (right) Households	56
Figure 7-2. Evolution of Authorized LPG Agents under the FISE Program	58
Figure 7-3. FISE Beneficiaries at the National Level	59
Figure 7-4. FISE Beneficiaries Living in Poverty, by Region	59

Tables

Table 1-1. Timeline of Peer Review Process	x
Table 2-1. Main Types of Fossil Fuel Subsidies	6
Table 3-1. Major Socioeconomic Indicators (1980–2010)	10
Table 3-2. GDP per capita in Latin America (in current US\$)	13
Table 4-1. Main Indicators of the Electricity Market 2011	25
Table 4-2. Percentage of Households that Use Different Energy Types (by Region)	29
Table 4-3. Energy Challenges in Peru	30
Table 5-1. Districts Affected by the Preferential VAT and ISC in Peru	34
Table 5-2. Lost Tax Revenues from VAT and ISC Exemptions on Sales of Fuels in the Amazon (US\$ thousand)	36
Table 6-1. Types of Different Price Adjustment Mechanisms	51

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ACRONYMS AND INITIALS

APEC	Asia-Pacific Economic Cooperation
APRP	APEC Peer Review Panel
Bcf	Billion cubic feet
BCRP	Central Bank of Peru (<i>Banco Central de Reserva del Perú</i>)
DCT	Direct Cash Transfer
DGH	Directorate General of Hydrocarbons (<i>Dirección General de Hidrocarburos</i>)
EIA	U.S. Energy Information Administration
EPP	Export Parity Price
EWG	Energy Working Group
FEPC	Fuel Price Stabilization Fund (<i>Fondo para la Estabilización de Precios de los Combustibles Derivados del Petróleo</i>)
FISE	Social Inclusion Fund (<i>Fondo de Inclusión Social Energético</i>)
FOB	Free On Board
FONAFE	National Fund for Financing the Entrepreneurial Activity of the State (<i>Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado</i>)
GDP	Gross Domestic Product
GHG	Greenhouse gas
GW	Gigawatts
IFFSR	Inefficient fossil fuel subsidy reform
IFH	Household targeting index (<i>Índice de focalización de hogares</i>)
IMF	International Monetary Fund
IPP	Import Parity Price
ISC	Selective consumption tax
ISO	Independent System Operator
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MEF	Ministry of Economy and Finance (<i>Ministerio de Economía y Finanzas</i>)
MIDIS	Ministry of Development and Social Inclusion
MINEM	Ministry of Energy and Mines (<i>Ministerio de Energía y Minas</i>)
MMCFD	Million cubic feet per day
MW	Megawatts
NRE	New Renewable Energy
OSINERGMIN	Supervisory Body of Investment in Energy and Mining (<i>Organismo Supervisor de la Inversión en Energía y Minería</i>)
PEN	Peruvian Nuevo sol
PPP	Public-Private Partnership
PPP	Purchasing Power Parity

RTO	Regional Transmission Organization
SEI	National interconnected electric system (<i>Sistema eléctrico interconectado</i>)
SISFO	Household targeting system (<i>Sistema de focalización de hogares</i>)
SUNAT	National Customs and Tax Administration (<i>Superintendencia Nacional de Aduanas y de Administración Tributaria</i>)
TCF	Trillion cubic feet
TFP	Total Factor Productivity
Twh	TeraWatt-hour
UNEP	United Nations Environment Programme
US\$	United States Dollar
VAT	Value-Added Tax
VPR	Volunteer Peer Review
WTI	West Texas Intermediate
WTO	World Trade Organization

Spanish Acronyms in English Translation

MEF	Ministry of Economy and Finance
MINEM	Ministry of Energy and Mines
MINAM	Ministry of Environment
MFA	Ministry of Foreign Affairs
DGPIP	Office of Public Income
DGPMAC	Office of Macroeconomic Policy
DGAEICYP	Office of International Economics, Competition and Productivity affairs
DGCCDRH	Office of Climate Change, desertification and water resources.
DGE	Office of Electricity
DGH	Office of Hydrocarbons
DGER	Office of Rural Electrification
DGEE	Office of Energy Efficiency
GART	Office of Price Regulation
DGIP	Office of Public Investment
MIDIS	Ministry of Social Inclusion
OSINERGMIN	Energy and Mines Regulator

PREFACE

Starting in 2009, APEC Leaders have committed “to rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption, while recognizing the importance of providing those in need with essential energy services.” In 2011, APEC Leaders agreed to set up a “voluntary reporting mechanism” that they would review annually to assess APEC’s progress toward this goal. APEC Leaders in 2013 agreed to build APEC economies’ regional capacity for meeting the APEC goal on fossil fuel subsidy reforms.

Fossil fuel subsidies incentivize fossil fuel production and consumption and can result in increased energy demand. Inefficient subsidies can lead to fiscal pressure on the government and harmful emissions and potentially undermine APEC’s sustainable green growth agenda. The APEC Energy Ministers noted in the 2012 Energy Ministers’ statement that “the reduction of subsidies will encourage more energy efficient consumption, leading to a positive impact on international energy prices and energy security, and will make renewable energy and technologies more competitive.” Such inefficient fossil fuel subsidies reform (IFFSR) can also reduce local pollution and greenhouse gas emissions.

Identifying appropriate reforms and implementing these reforms is challenging despite the benefits for individual economies. Therefore, an APEC voluntary peer review (VPR) process on reform of inefficient fossil fuel subsidies can help APEC economies identify reform options and help disseminate best practices on reform of inefficient fossil fuel subsidies. The VPR can also improve the quality of voluntary reporting to APEC Leaders.

Peru is the first of several volunteer member economies that are expected to participate in the fossil fuel subsidy reform peer review process. Peru believes, as do other APEC economies, that any measure that promotes wasteful consumption of fossil fuels is ineffective and should be reformed. The objectives of peer review are consistent with the Peruvian National Energy Policy objectives of (1) diversification of the energy matrix toward a more clean and sustainable one, and (2) avoidance of the introduction of market distortions in order to promote the investment in new and better technologies.

The VPR for fossil fuel subsidies is led by the APEC Energy Working Group (EWG). This peer review report is the culmination of the activities conducted under APEC EWG, with support from Nathan Associates and ICF International under the United States Agency for International Development (USAID) U.S.-APEC Technical Assistance to Advance Regional Integration Project, both of which served as the secretariat for the APEC Peer Review Panel (APRP).

The main report is divided into two parts. The first presents the need for fossil fuel subsidy reform, discusses the background to the APEC VPR process, and provides an overview of Peru's economy, socio-demographics and the energy landscape. The second part details the history and context of the reviewed subsidies, presents the key findings and recommendations from the APRP, and highlights some lessons learned and best practices for reform.

Dr. Phyllis Yoshida
Lead Shepherd,
APEC EWG

EXECUTIVE SUMMARY

APEC Leaders in 2013 agreed to build regional capacity to assist APEC economies in rationalizing and phasing out inefficient fossil fuel subsidies that encourage wasteful consumption, while recognizing the importance of providing those in need with essential energy services. As part of such capacity building, APEC set up a voluntary peer review (VPR) process to support the progress of APEC economies toward the group's shared goal of phasing out inefficient fossil fuel subsidies that promote wasteful consumption. At the November 2013 APEC Energy Working Group (EWG) meeting in Da Nang, Vietnam, Peru volunteered to be the first APEC economy to undergo the voluntary peer review of inefficient fossil fuel subsidy reform (VPR/IFFSR). The APEC peer review was conducted according to the guidelines endorsed at the November EWG 2013 meeting, and a Secretariat set up for purposes of the Peru review.

The Secretariat worked closely with the EWG Lead Shepherd and the EWG Secretariat to provide technical and logistical support for this first VPR/IFFSR in Peru. A timeline of activities conducted for this peer review is shown in Table ES-I. An APEC Peer Review Panel (APRP) was established under guidance from the EWG Lead Shepherd, consisting of volunteers from the APEC and ASEAN economies. The APRP for the Peru VPR consisted of five experts from Indonesia, Cambodia, New Zealand, and the United States.

In coordination with the Secretariat and the EWG Lead Shepherd, Peru selected three policy instruments for evaluation by the APRP:

- The **Preferential Value-Added Tax (VAT) Exemption**, which was promulgated to promote economic development in Peru's Amazon Region;
- The **Fuel Stabilization Fund (*Fondo para la Estabilización de Precios de los Combustibles Derivados del Petróleo, FEPC*)**, which was developed to protect Peru's consumers from the volatility of international fuel prices; and
- The **Social Inclusion Fund (*Fondo de Inclusión Social Energético, FISE*)**, which was designed to protect Peru's most vulnerable populations and improve their access to commercial fuels.

Peru also indicated that rather than focusing on the inefficiency of the selected subsidies, the APRP should focus on the "effectiveness" of the subsidies.

Table ES-1. Timeline of Peer Review Process

Activity	Month						
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
APEC EWG Lead Shepherd, Secretariat, and Peru's Ministry of Economy and Finance (MEF) finalize scope of Peer Review and Planning for the APRP visit to Lima							
MEF collects required information and data for submission to Secretariat							
MEF and Secretariat coordinate peer review meetings							
Secretariat produces draft of background paper							
APRP conducts Peer Review Meetings with technical staff/senior officials from different ministries, FISE beneficiaries, and industrial stakeholders							
APRP draws key conclusions about subsidies and develop recommendations for reforming subsidies							
Secretariat updates the background material that is included in draft report as "Part 1: Background" section of this report.							
Secretariat, with APRP input, develops the Draft Report with Conclusions, Recommendations, and Lessons Learned included as Part 2: Key Findings and Recommendations" section of this report							

The key findings and the end goal for each of the subsidies are provided in Table ES-2 below.

Table ES-2. Key Findings and End Goals for the Three Evaluated Subsidies

Subsidy	Key Findings	End Goal
Preferential VAT	<ul style="list-style-type: none"> • The VAT exemption for Amazon regions is ineffective. • The exemption has led to wasteful and inefficient consumption of fossil fuels. • Richer population groups tend to gain more benefit than the poorer groups, because the rich tend to consume more fossil fuel than the poor. • The VAT exemption has not met its objective of economic development of Amazon regions. • The VAT exemption results in high fiscal costs to Peru. 	<ul style="list-style-type: none"> • The VAT tax exemption should be eliminated, and replaced by targeted social and regional development programs aimed at improving schools, hospitals, transportation, and other infrastructure.
Fuel Price Stabilization Fund (FEPC)	<ul style="list-style-type: none"> • The FEPC has likely caused higher fossil fuel consumption than would otherwise be the case. • The FEPC has resulted in significant fiscal costs to Peru. • Incremental reforms to the FEPC have been positive. • The FEPC has likely undermined the competitiveness of the economy's refineries. • The potential benefits of FEPC are poorly targeted. • FEPC has only marginally reduced inflationary pressures. 	<ul style="list-style-type: none"> • Depoliticize fuel pricing completely and eventually close down the FEPC, which is in line with the Peru's long term goal as well. • The FEPC should be removed in a phased manner and should be accompanied by appropriate offsetting measures targeted to vulnerable segments of the population.
FISE	<ul style="list-style-type: none"> • FISE is effective in meeting its goal of providing fuel 	<ul style="list-style-type: none"> • The FISE program should continue as

Subsidy	Key Findings	End Goal
	<p>access to the Peruvian populations that it is designed to serve.</p> <ul style="list-style-type: none"> • FISE does not substantively increase the consumption of fossil fuels. • Cuzco pilot for FISE rollout was a well-thought out and successful pilot program. • FISE has been successful in its outreach and communication to eligible groups. • FISE is a good model for other similar government programs. • Revenue collection for FISE appears effective but the full economic costs of these cross subsidies are not understood. A review of these economic costs should be undertaken. • There are unintended charges that need to be addressed. • Impacts on FISE recipients have been positive. 	<p>well as current efforts to examine methods for improving the program.</p> <ul style="list-style-type: none"> • FISE should be expanded to segments of the population that are not currently being served.

In essence, the APRP concluded that two of the subsidies, namely the VAT exemption for fossil fuels in the Amazon regions and the FEPC, should be removed in the long term. The VAT exemptions in the Amazon region have led to wasteful and inefficient use of fossil fuels, and this subsidy has not met the goal of increasing economic development in the Amazon region. The FEPC has likely resulted in greater fossil fuel consumption than would otherwise have been the case. With the removal of the remaining fuels from the FEPC over time, the FEPC can be fully cancelled. Both the Amazon VAT exemption and the FEPC tend to benefit richer population groups more than the poor because the rich consume more fossil fuels than the poor.

On the other hand, the subsidies for liquefied petroleum gas (LPG) through the FISE provided to vulnerable households should be maintained and expanded quickly to reach the targeted population. The APRP finds that the FISE program does not significantly increase fossil fuel consumption and is beneficial to the targeted populations that it is intended to serve. Expanding the LPG subsidies to the vulnerable populations not currently covered would extend the FISE benefits to all regions in Peru. That said, the full economic costs of this cross subsidy are not understood, and a full cost-benefit analysis would help identify the magnitude of these economic costs.

Based on these conclusions and expected end-goals, as defined by the APRP during its deliberations, a set of consensus-driven recommendations were developed. The recommendations were aimed at not being too prescriptive, and they represent a compromise position that all APRP members agreed to. These seventeen recommendations are shown in Table ES-3 below.

Table ES-3. APRP Recommendations for the Three Evaluated Subsidies

Subsidy	Recommendations
Preferential VAT	R1—Remove fossil fuel VAT exemption as an initial step toward a broader tax reform initiative R2—Create regional infrastructure and social equity funds for targeted social and infrastructure programs to meet the needs of low-income individuals as well as development of the Amazon region R3—Develop a specific investment plan for direct public investments R4—Use positive outreach and communication methods implemented in FISE for newly targeted social and development programs, to be implemented during phase-out of the tax exemptions for fossil fuels
FEPC	R5—Move packaged LPG out of the FEPC and focus efforts on expanding the FISE R6—Move diesel for public transport into the FISE R7—Gradually reduce the time between bandwidth adjustments as a potential precursor to total removal of other transport diesel from the FEPC R8—Use other macroeconomic tools to control inflation (e.g., interest rates) R9—Consider increases in excise rates on fuel to reduce the volatility of oil price increases felt by consumers R10—Increase use of natural gas in the transport fleet to reduce costs and volatility to end-users
FISE	R11—Accelerate rollout of the program R12—Review eligibility criteria and automatically update subsidy values over time R13—Expand the LPG distribution network R14—Conduct a detailed cost-benefit analysis of FISE to analyse the economic costs of the cross-subsidy on other sectors of the economy R15—Track status of recipient households R16—Continue to hold periodic stakeholder meetings to solicit feedback on FISE implementation R17—Expand the FISE model

There are a few linkages among the various APRP recommendations for all three subsidies, and therefore reform strategies for each of the subsidies can be considered in tandem. In order to reform the VAT exemptions for the Amazon, the APRP suggests that Peru consider removing fossil fuel VAT and ISC exemptions as an initial step towards a broader tax reform package that may involve removal of all VAT subsidies. There is sufficient capacity within Peru to assess the broader VAT exemptions, as indicated by the extensive and ongoing studies on this issue. VAT removal should be combined with funds for specific social programs and infrastructure investments in the Amazon. The APRP does not identify specific programs and investments because the APRP believes that Peru is in the best position to determine the appropriate compensation packages.

Removal of the FEPC should be considered in a gradual manner, with the removal of packaged LPG from FEPC first and with any necessary support provided through FISE. Similarly, diesel for public transport could also be removed from FEPC and moved into an expanding FISE program for targeted populations and sectors. Macroeconomic tools other than price controls on fuels could be used to control inflation (e.g., interest rates). Communication is a crucial issue for the removal of both subsidies, and the government should develop a coherent communication plan (e.g., public awareness campaigns) once a specific strategy is agreed upon.

FISE is a relatively new program in Peru, but it has shown itself to be successful. The government has undertaken steps to ensure that the program is revised based on pilot studies and lessons learned through its implementation thus far. APRP recommends that a detailed cost-benefit analysis be conducted of FISE to ensure that all of the economic costs of the cross-subsidy are understood. The cross-subsidy is a relatively effective and low-cost means of raising revenue, but it imposes costs on other sectors of the economy that are not well understood. This revenue raising mechanism could then be contrasted with the more conventional approach of funding such schemes out of general taxation.

The LPG distribution network should be expanded as part of accelerating the rollout of the program. As noted above, all LPG subsidies should be incorporated within the FISE, and similarly subsidies for specific sectors can also rely on the already established operational mechanisms used under the FISE programme.

There are specific lessons learned and best practices that Peru can use in developing its implementation plans for reforms. The report provides some of these best practices and lessons learned, but further analysis should be conducted to specifically identify an implementation strategy for the APRP recommendations. Peru has been undertaking subsidy reforms in a progressive fashion for many years, and the APRP recommends a continuation of these reform efforts for the remaining subsidies in place, Peru already has well-established mechanisms for interministerial coordination, and these mechanisms should be used to focus discussions among relevant ministries on the APRP recommendations. A coherent plan with specific implementation strategies should be developed and executed through these intergovernmental mechanisms.

I. INTRODUCTION AND FFSR PEER REVIEW PROCESS

The APEC Energy Working Group (EWG) endorsed a Voluntary Peer Review of Inefficient Fossil Fuel Subsidy Reform (VPR/IFFSR) proposal in March 2013, at the EWG45 meeting in Thailand. The proposal aimed to build regional capacity to assist APEC economies in rationalizing and phasing out inefficient fossil fuel subsidies that encourage wasteful consumption, while recognizing the importance of providing those in need with essential energy services.¹ The proposal put in place an ongoing series of reviews of inefficient fossil fuel subsidies across APEC economies that volunteer to be a part of this review process. The reviews are “peer reviews”— i.e., the reviewers are from peer APEC economies and relevant institutions, with expertise in energy, fossil fuels, finance and economics. Guidelines for the VPR/IFFSR process were approved at the November 2013 EWG46 meeting in Da Nang, Vietnam.² The VPR/IFFSR guidelines are modeled after the ongoing APEC peer reviews on energy efficiency (PREE).

At the EWG46 meeting, Peru volunteered to undertake the VPR/IFFSR, and planned for its peer review in early 2014. The guidelines for the VPR/IFFSR called for a “VPR/IFFSR Secretariat” (hereafter, the Secretariat) to coordinate the activities associated with the VPR.

The Secretariat worked closely with the EWG Lead Shepherd and the EWG Secretariat to provide technical and logistical support for the first VPR/IFFSR in Peru. The EWG Secretariat issued a call for volunteers for the APEC Peer Review Panel (APRP) members. Seven volunteers responded to the call, and five volunteers were selected by the EWG Secretariat, with approval from the EWG Lead Shepherd and agreement of the Government of Peru. Dr. Terry Surles was designated as the APRP Team Leader. The biographies of the APRP members and the Secretariat are in Appendix C.

In March 2014, the Secretariat also began its interactions with the Ministry of Economy and Finance (MEF) in Peru, to begin planning for the APEC peer review panel (APRP) to conduct the peer review in late June 2014. The MEF was designated by Peru as the primary point of contact for the Secretariat. The MEF and the EWG Secretariat confirmed the dates (June 23–27) for the Peer Review visit to Lima, Peru.

In coordination with the Secretariat and the EWG Lead Shepherd, MEF selected three different policy instruments for evaluation by the APRP:

- a tax provision that was originally enacted to promote economic development in the Amazonian region;
- a pricing mechanism for petroleum products designed to protect Peruvian consumers from volatility on international markets (*Fondo para la Estabilización de Precios de los Combustibles Derivados del Petróleo, FEPC*); and

¹ http://www.iisd.org/gsi/sites/default/files/g20lib_apec_2013_peerrvwconceptnote.pdf

² <http://www.ewg.apec.org/documents/EWG46%20Summary%20Record.EWG46.Website.pdf>

- a LPG subsidy program (*Fondo de Inclusión Social Energético, FISE*) designed to help the most vulnerable³ consumers in Peru to obtain access to commercial fuels.

Peru indicated that rather than focusing on the inefficiency of the selected subsidies, the APRP should focus on the “effectiveness” of the subsidies. The term inefficiency has multiple meanings in different contexts (e.g., economists typically view any and all subsidies as being inefficient), and therefore Peru requested the APRP to assess the effectiveness of the subsidies based on their intended goals and success.

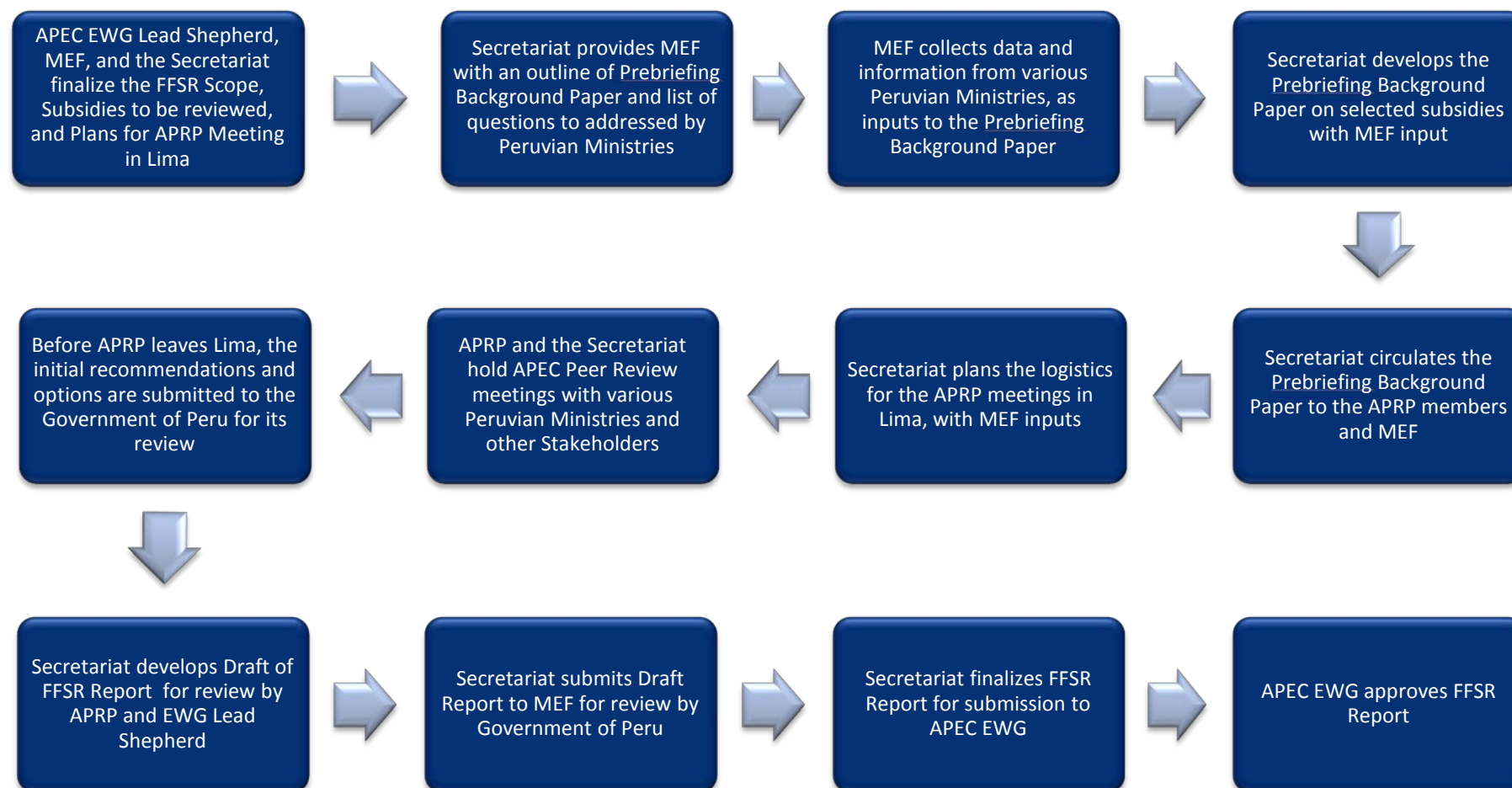
The three instruments vary in effectiveness in achieving their stated goals or objectives. Peru intended to use the VPR/IFFSR to exchange information and obtain policy recommendations for effectively eliminating subsidies to fossil fuels in the long run. Further, the discussions with APRP were intended to explore best practices or alternatives for addressing the objectives that instruments were meant to address. These objectives are consistent with those of the APEC VPR/IFFSR process.

Figure I-1 shows the overall approach and process undertaken by the Secretariat and MEF for the APEC VPR/IFFSR in Peru. As part of the preparation for the APRP visit, the Secretariat also worked with APRP members to finalize their travel logistics, as well as coordinated with the MEF on the schedule of Peer Review meetings in Lima, Peru. The final schedule and the list of participants for the visit are in Appendix A, and meeting summaries are in Appendix B.

The APRP and the three members of the Secretariat met in Lima to discuss the schedule and plan for the meetings with Government of Peru on Sunday, June 22. The meeting schedule consisted of three days of meetings (Monday through Wednesday) with five different ministries and a number of departments within these ministries. On Wednesday, two APRP members also visited beneficiaries of one of the subsidies outside of central Lima to gain first-hand knowledge of how the subsidy programs were working. Thursday was designated for the APRP to develop its key findings and recommendations, which were communicated to the Government of Peru on Friday morning. The Government of Peru provided their suggestions and additional clarifications to the APRP during this meeting. They also asked for examples of how other jurisdictions had managed similar issues. On Saturday, June 28, the APRP further developed the findings, recommendations, and lessons learned for the three subsidies. The APRP members left Lima on Saturday. During the Saturday meetings, the APRP carefully considered the recommendations in order not to be too prescriptive, and the recommendations presented in this report represent the compromise position that all APRP members agreed to. The recommendations, as well as the lessons learned and best practices, provide inputs to Peru, as it develops specific and strategic reform options.

Following the peer review meetings in Lima, the Secretariat continued the APRP’s work and finalized the draft report for review by the APRP members, EWG Secretariat, EWG Lead Shepherd, and the Government of Peru. Comments by these reviewers are incorporated into this final report.

³ Vulnerable population generally refers to a population group with weakness, disadvantage or problems for the performance and the social mobility (based on FISE definition).

Figure I-1. Development of APEC IFFSR Voluntary Peer Review Process in Peru

PART I: BACKGROUND

Part I of the report contains background information for the APEC peer review of the fossil fuel subsidies selected by Peru. The three sections below are focused on: a) a summary of the need for fossil fuel subsidy reforms in general; b) an overview of the macroeconomics and sociodemographics; and c) a brief overview of the energy landscape in Peru. The Government of Peru contributed to the information on the Peruvian economic and energy context, with additional research undertaken by the Secretariat.

2. ENERGY SUBSIDIES

Energy subsidies, particularly in low- or middle-income economies, are assumed to protect consumers from sharp increases in energy and other commodity prices (UNEP 2008; IMF 2013a). Providing stable, low-cost sources of domestic energy is also thought to provide a means for economic development and growth. However, protecting consumers from energy and commodity price increases comes with a price, as the economy has to compensate for the subsidies in some other way. Government expenditures for energy subsidies can worsen fiscal imbalances, and divert funds from high-priority public spending and private investment. Subsidies can also lead to inefficient allocation of resources, and they often lead to overconsumption of energy. Such a situation can drive imbalances in trade for net energy importers, reduce incentives for the adoption of renewable energy and energy efficiency, and accelerate natural resource depletion. Finally, the benefits of energy subsidies are not often limited to the targeted lower-income population; instead, most often the benefits are captured by higher-income consumers, as well as leading to perverse incentives. These distributional effects actually extend to future generations in the form of reduced availability of key inputs for future growth and increased damages from greenhouse gas emissions (IMF 2013a).

Energy subsidies absorb measurable levels of global GDP and government revenue. In 2011, pretax⁴ energy subsidies totaled US\$480 billion (0.7 percent of global GDP or 2 percent of government revenue),⁵ and are concentrated in low- and middle-income economies (IMF 2013a; Clements et al. 2014). The largest subsidies are for petroleum products, about 44 percent.⁶ Latin America accounted for about 7.5 percent of the total global pretax subsidies, which is approximately 0.5 percent of regional GDP or 2 percent of total government revenues (IMF 2013a). Subsidies were mainly for petroleum products, accounting for about 65 percent of the total subsidies in the region. With rising oil prices over the past decade, the costs of subsidies have risen and become a motivation for subsidy reform (*The Economist* 2014b).

Despite the negative aspects of energy subsidies, they are often difficult to reform due to political resistance from stakeholders who are receiving the most benefit (IMF 2013a; Clements et al. 2014). The reforms also lack political and public support, reflecting lack of trust in a government's ability to reallocate expenditures to programs that support broader initiatives to support vulnerable or low-income population groups. Inflationary concerns and competitiveness issues can also dominate governmental decisions. In many economies undergoing reform, there is often resistance from state-owned or state-operated

⁴ Subsidies can be categorized as pretax or post-tax. Pretax subsidies exist when consumers and firms pay less than the costs of supply and distribution. Post-tax subsidies exist when levels of taxation on energy (or energy producing activities) are not taxed at economically efficient levels.

⁵ Post-tax subsidies are substantially larger, amounting to an estimated US\$1.9 trillion in 2011 or 2.5 percent of global GDP and 8 percent of government revenues. Petroleum products accounted for roughly half or US\$879 billion of the post-tax subsidies (IMF 2013a).

⁶ The number does not include the "deadweight losses" or lost economic efficiency resulting from government intervention. Deadweight losses would probably add at a minimum another 40 percent (*The Economist* 2014a).

enterprises, as they are concerned about the effect on their operations in a more competitive business environment.

FOSSIL FUEL SUBSIDIES

There are two distinctly different definitions of a “subsidy” among the international community. The International Energy Agency (IEA) uses an “effects test” to determine whether a subsidy exists (APEC/EWG 2012). The effects test is applied by determining whether a policy instrument lowers production costs of energy or raises prices received by energy producers or lowers energy prices to the consumer. On the other hand, the World Trade Organization (WTO) uses a definition based on the policy instruments used to pass a subsidy to the recipient, and this definition can be applied to any sector (APEC/EWG 2012). The subsidy-generating policy instruments can include: (1) government transfers of funds or potential transfers of either funds or liabilities; (2) forgone revenue; (3) government procurement policies; and, 4) government income or price support. The IEA definition overlooks the potential for an effect to be the result of more than one government intervention. The WTO definition provides a more accurate picture as to exactly what subsidies are in place and allows for the identification of subsidy-specific costs and impacts (APEC/EWG 2012). Even with these apparent differences, no consensus on the definition has been reached.

From a practical standpoint in terms of reform, identification of a subsidy is the first step in the process. Table I-I has an overview of the classes of subsidies that can be used in the energy sector (UNEP 2008).

Table 2-I. Main Types of Fossil Fuel Subsidies

Government Intervention	Example	How the subsidy usually works		
		Lowers cost of production	Raises price to producer	Lowers price to consumer
Direct financial transfer	Grants to producers	●		
	Grants to consumers			●
	Low-interest or preferential loans	●		
Preferential tax treatment	Rebates or exemptions on royalties, sales taxes, producer levies and tariffs	●		
	Tax credit	●		●
	Accelerated depreciation allowances on energy supply equipment	●		
Trade restrictions	Quotas, technical restrictions, and trade embargoes		●	
Energy-related services provided directly by government at less than full cost	Direct investment in energy infrastructure	●		
	Public research and development	●		
	Liability insurance and facility decommissioning costs	●		
Regulation of the energy sector	Demand guarantees and mandated deployment rates	●	●	
	Price controls		●	●
	Market-access restrictions		●	

Source: UNEP, 2008

Identifying a subsidy requires understanding how the subsidy arose, the costs of the subsidy, who receives the subsidy, and the impacts of the subsidy on the economic and energy systems. Once these attributes have been identified, then consideration of potential reform options is possible. Reform options need to be defined in terms of new policies (pricing/taxation) and, in some cases subsidy reforms need to be coupled with complementary policies for a transition period. The timing of reforms and potential political strategies for implementing the reforms also need to be considered. Therefore, the reform is not a simple process; it requires a structured, sequential, formalized approach (APEC/EWG 2012).

LESSONS LEARNED FROM FOSSIL FUEL SUBSIDY REFORM

Over more than a 20-year period, well over two dozen economies have attempted fossil fuel subsidy reform. These previous fossil fuel subsidy reform attempts can be classified into three categories⁷ (Clements et al. 2014; IMF 2013a):

- Success: Reform led to permanent and sustained reductions of a subsidy;
- Partial Success: Reform achieved a reduction of the subsidy for at least a year, but then the subsidy re-emerged or remained a policy issue; and
- Failure: Reforms rolled back soon after the reform (e.g., resistance to price increases or efforts to improve energy sector efficiency pushed back).

There are a number of lessons to be learned about the reform process from the history of previous reforms. Generally, energy subsidy reforms are more likely to succeed when the following components exist (Clements et al. 2014; IMF 2013a):

- a comprehensive reform plan;
- a holistic communications strategy, supported by increased transparency measures;
- energy price increases that are phased and sequenced differently across different energy products;
- specific mitigating measures that are targeted to protect the poor; and,
- depoliticizing energy pricing, so that subsidies do not come back.

Most successful reforms were well planned and based on a clear strategy. A comprehensive reform plan requires: 1) clear long-term objectives, 2) assessment of likely impact of reforms, and 3) extensive stakeholder consultations (Clements et al. 2014; IMF 2013a). Successful and durable subsidy reforms often require the effort to be part of a broader reform agenda. “In particular, reforms should incorporate both a sustainable approach to energy pricing and a plan to improve the efficiency of energy consumption and supply” (IMF 2013a, pg. 25). While developing a comprehensive subsidy reform strategy, it is critical to conduct studies that assess impacts of the potential reforms on various stakeholders and identify measures to reduce adverse impacts. The studies need to consider fiscal and macroeconomic economic impacts, along with evaluating the winners and losers (IMF 2013a). Finally, stakeholders should be involved in development of a subsidy reform strategy.

Gaining political and public support for a reform effort requires a communications strategy and transparency (Clements et. al 2014). “A review of subsidy reform experiences found that the likelihood of success almost tripled with strong public support and proactive public

⁷ Of the 28 economies studied by the IMF, 12 had fully successful reform attempts; 11 had only partially successful attempts while the remainder failed (*The Economist* 2014b, 68–70). Fourteen of the economies were receiving money from the fund, and some of these economies were subject to credit downgrades if reform was not undertaken.

communications” (IMF 2013a, pg. 27).⁸ The benefits of removing subsidies should be couched in terms of ability to finance other high-priority spending (investments) on education, health, infrastructure, and social safety net. Transparency is another key tool that buttresses a successful communications strategy. Some of the relevant information that needs to be communicated include: “(i) the magnitude of subsidies and how they are funded”; “(ii) the distribution of subsidy benefits across income groups; (iii) changes in subsidy spending over time; and (iv) the potential environmental and health benefits from subsidy reform” (IMF 2013a, pg. 27).

Pace and timing of price increases, and sequencing of those increases determines success (Clements et al. 2014). A phased but consistent approach to reforms provides time for households, private enterprises and the government agencies to adjust to the reforms, and the government can show over time how the subsidy savings is being used for a good cause.⁹ A phased approach also helps reduce the impacts of inflation and allows a government to build other more sustainable social safety nets. Further, sequencing reform for “luxury” products first will shield lower-income groups until later rounds, and further build public support among the lower-income population. Sequencing should take into account spillovers across products and the consequences for environmental goals.

Public support for subsidy reforms depends on how well the government implements the mitigating measures that reduce the impacts of energy price increases on the poor (Clements et al. 2014). Targeted cash transfers (often in the form of vouchers) are often used as compensation for the increased prices. Cash transfers not only provide flexibility for recipients, but also remove governments from the need to be directly involved. However, cash transfers are potentially subject to corruption and misuse if they are not administered appropriately. If cash transfers are unfeasible, efforts should be focused on programs that can be expanded quickly such as “school meals, public works, reductions in education and health user fees, subsidized mass urban transport, subsidies for consumption of water and electricity below a specified threshold” (IMF 2013a, pg. 31). Other measures include providing alternative sources for cooking (substituting LPG for kerosene) or off-grid electricity access. Such complementary measures coupled with the subsidy reforms can help soften the impacts of the reforms.

Initial public reaction to price increases on international energy markets should not be allowed to reverse subsidy reform efforts—i.e., pricing of commodities should be depoliticized (Clements et al. 2014). Automatic pricing mechanisms reduce the possibility of subsidy reversal by distancing the government from energy pricing. Consumers need to be clear that domestic price changes reflect changes in international markets, which are out of the control of any single government. Delegation of such pricing mechanisms to an independent entity ensures that reform can proceed as planned. Finally, adoption of a smoothing rule into an automatic pricing mechanism can help avoid sharp increases in domestic prices.

⁸ Economies with good public information campaigns include Indonesia (text messaging), the Philippines (nationwide road-show), and Uganda (selling the media on subsidies as a social program) (*The Economist* 2014b).

⁹ India is phasing out subsidies slowly and reducing the overall cost of subsidies from 1 percent of GDP in 2013 to less than 0.5 percent in 2016 (*Economist* 2014b). At the same time, the net effect on government revenues will be offset by rising food subsidies.

3. MACROECONOMICS AND SOCIODEMOGRAPHICS

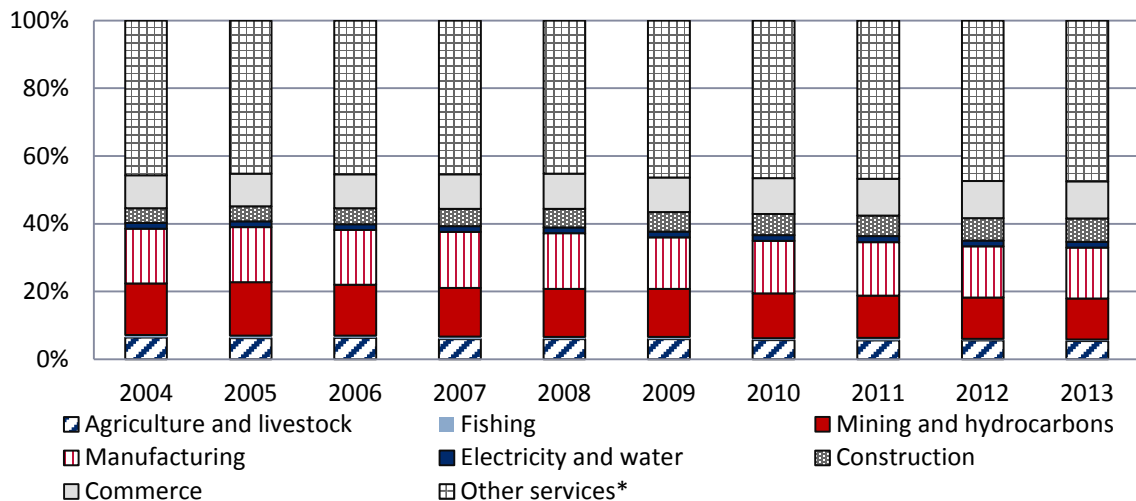
In this section, the macroeconomics situation and the socio-demographic conditions in Peru are presented. These elements provide a context for evaluation of the three subsidies selected by Peru, and for the development of recommendations by the peer review panel.

MACROECONOMIC CONDITION

The Peruvian economy is dominated by the natural resource industries. Figure 3-1 illustrates the shares of real GDP provided by the major economic sectors within the economy. The production of metals, primarily copper, but also gold, lead, zinc, and silver, and fossil fuels, accounted for 12 to 15 percent of real GDP between 2003 and 2013. Real annual growth of output from mining and fuel production has averaged 4 percent since 2003. These activities are cyclical in nature, and mining is highly dependent on the levels of exports and commodity prices on international markets.

Manufacturing has contributed about 15 percent to 16 percent of real GDP between 2003 and 2013. Output from manufacturing has grown at a real average annual rate of 6 percent and does not have the cyclical changes exhibited by the natural resource-based sectors. Construction and commerce (e.g., retail) have been steadily increasing in share of real GDP since 2003.¹⁰ The expanded shares of both construction and commerce are due to consumer demand, which is expected to remain strong in the near term.

Figure 3-1. Share of GDP by Economic Activity



Note: "Other services" includes import duties and taxes on products.. The data is based on real GDP in millions of 2007 Nuevo Soles.

Source: Data from Appendix 11, pg., 249 of Central Reserve Bank of Peru (BCRP), 2013.

¹⁰ The share of construction in real GDP has grown from 4.3 percent to 6.9 percent, while commerce has grown from 9.7 percent to about 11 percent.

Table 3-1 illustrates that since 2000 Peru has had a period of strong output growth and relatively low inflation (MEF 2012). During the 1980s and 1990s, Peru was faced with considerable external debt (i.e., the current account), very high rates of inflation, declining prices on export commodity markets (i.e., terms of trade¹¹), and internal political and social strife. Since 2000, with the institution of various governmental reforms, Peru's economy has become one of the fastest growing in the world. This has resulted in increasing per capita income and improvement in the economy's rating on the World Bank Human Development Index. The World Bank now considers Peru as upper middle-income. During this period of growth Peru has maintained a strong fiscal and macroeconomic position; Peru is in the top 20 economies in the World Economic Forum's Macroeconomic Environment Pillar¹² indicators (MEF 2014a; MEF 2014b).

Table 3-1. Major Socioeconomic Indicators (1980–2013)

	1980–89	1990–99	2000–05	2006–10	2000–10	2011–13
Real GDP (Var. % average year)	0	3	4	7	5	6
Consumer Prices (Var. % average year)	481	808	2	3	2	3
Terms of Trade (Index 1994=100)	--	101	93	116	104	110
Current Account (% GDP)	-6	-6	-1	0	-1	-3
Investment (% GDP)	17	18	16	23	19	29
GDP per capita (US\$ / inhabitant)	1,323	1,857	2,250	4,045	3,066	6,183
Unemployment (Average period)	6.5	8.2	9.2	8.3	8.9	6.8
Human Development Index (Ave. period)	0.6	0.649	0.689	0.725	0.720	0.739
Population (Var. % average year)	2.4	1.8	1.4	1.2	1.3	1.1

Source: BCRP, 2014; INEI, 2009; UNDP, 2014; IMF, 2014b.

In 2013, the Peruvian economy grew 6.0 percent, which is slightly lower than the growth rate of 6.3 percent in 2012 and 6.9 percent in 2011. However, these growth rates are consistent with the estimated long-term growth rate of 6.5 percent (BCRP 2012; MEF 2014b). These high levels of growth were driven by strong consumer demand, which grew at rates of 7.0 to 7.4 percent, and strong growth in public (13.6 percent–20 percent) and private (10 percent–20.8 percent) investment. These high levels of investment have resulted in strong growth in total factor productivity (TFP).¹³ Often TFP is viewed as the real driver of growth within an economy and may account for as much as 60 percent of an economy's growth. During 2000–2011, Peru's TFP grew at an average annual rate of 1.6 percent, which is among the highest in Latin America. Further, during this same period the average annual inflation rate was only 2.0 percent to 2.6 percent, which is among the lowest in Latin America. As a result of these factors, Peru is currently very attractive to continuing foreign direct investment.

A long period of such economic conditions has resulted in a labor market marked by falling rates of unemployment. Over the period from 2001 to 2012 in Lima, the unemployment

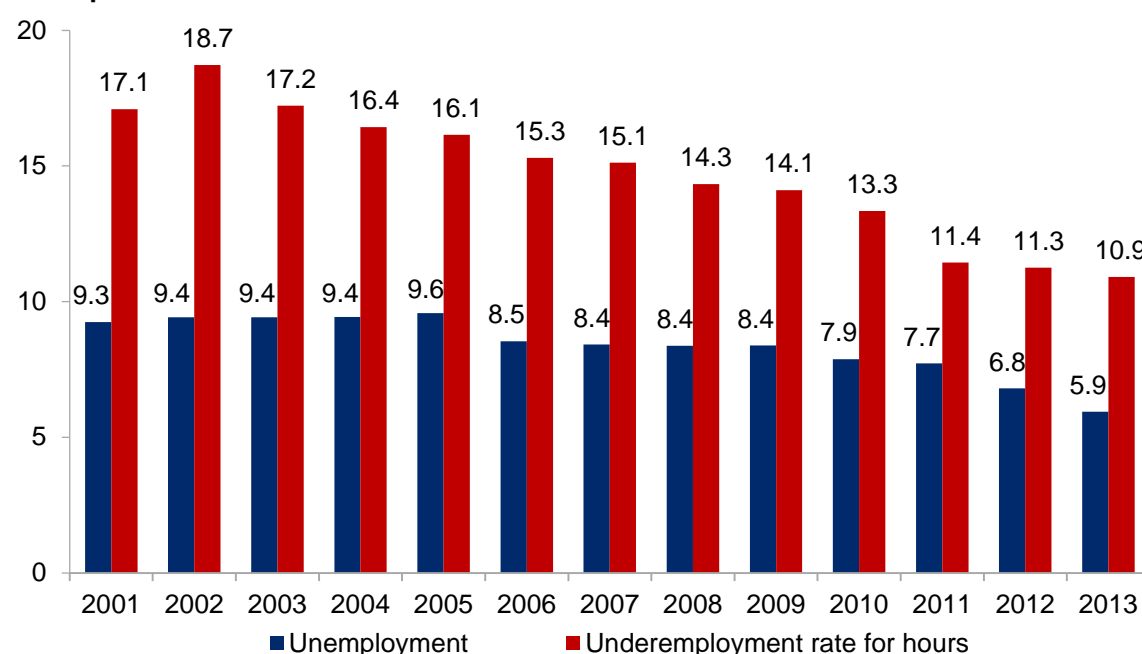
¹¹ Terms of trade refers to the ratio of export prices to import prices. A ratio of less than 100 percent means that more capital is flowing out of the economy to buy imports than flowing in.

¹² This indicator uses improvements in key macroeconomic variables such as the government budget balance, gross government debt, gross national savings and inflation.

¹³ Total factor productivity (TFP) is also referred to as multifactor productivity. High levels of TFP can be taken as measures of long-term technological change in an economy or technological dynamism.

rate has fallen by 2.4 percentage points and the underemployment rate has fallen by 5.8 percentage points (BCRP 2012). Figure 3-2 illustrates the evolution of the labor markets in Peru's largest urban area, and similar evolution has occurred in other major urban areas in the economy.

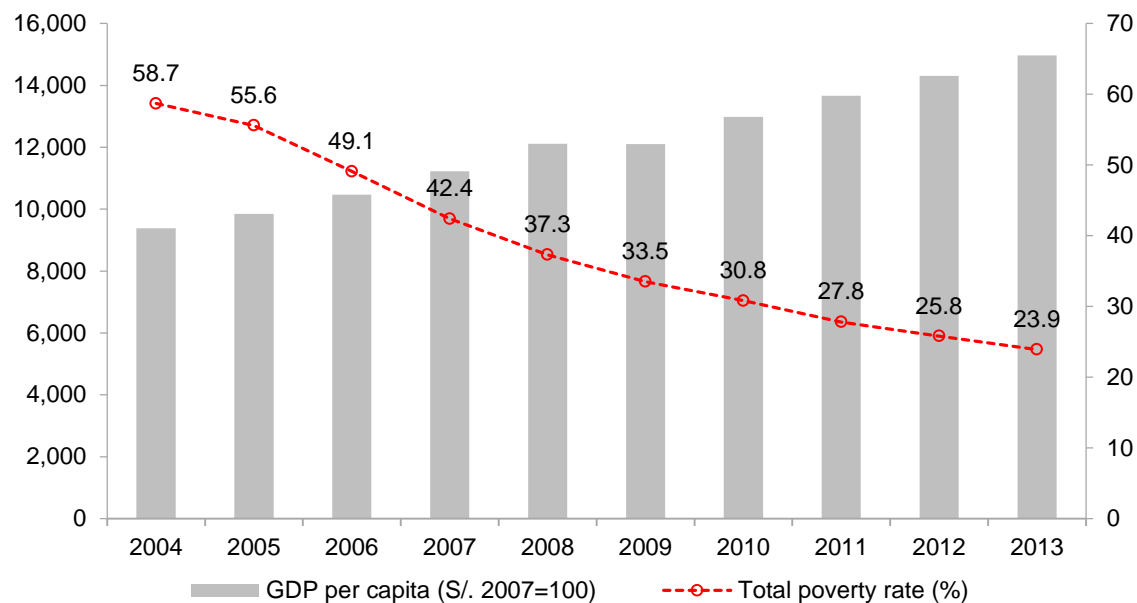
Figure 3-2. Unemployment and Underemployment Rates by Worked Hours in Metropolitan Lima



Note: Underemployment refers to people that are employed, but are working less than 40 hours a week.

Source: INEI, 2013.

A growing economy with a tightening labor market but low inflation rate has meant that the economic condition of the Peruvian population is continuing to improve. Figure 3-3 illustrates the transition of the Peruvian population as its economy has grown. Often, total poverty is used as a measure of wellbeing reflecting the ability of a population to obtain basic needs and non-basic needs relative to the poverty line. As per capita real GDP has risen by 50 percent over the period 2004 through 2011, the percentage of the population in total poverty has declined by close to 31 percent (BCRP 2012). Extreme poverty (or the inability to meet even basic needs) has declined by nearly 60 percent. Given this evidence of the decline in the poverty rate with growing per capita income, the time appears to be ripe for fossil fuel subsidy reforms.

Figure 3-3. Evolution of Total Poverty and Gross Domestic Product Per Capita

Source: BCRP, 2014; INEI, 2009; INEI, 2014b.

The 2014 macroeconomic forecast from the Peruvian Ministry of Economics and Finance (MEF) projects the Peruvian economy to continue to achieve strong growth over the next four years (MEF 2014a). Real GDP is expected to be near or at the long-term rate of growth.¹⁴ Further, private consumption is assumed to continue to grow at roughly the same rates as observed in the recent past; and finally, strong growth for both public and private investment is expected. With this level of growth, public debt should also decline. If such an economic environment were to come to fruition, then Peru will continue to draw investment, increase the number of high-paying jobs, and fuel economic growth—all factors which are key to improving the quality of life and reducing poverty.

The MEF's GDP forecast is based on the assumptions that the global economy will gradually recover from the 2007 to 2009 recession, significant private investment projects will materialize, and consumer and business confidence will remain high (MEF 2014b). If the economic recovery continues at a sluggish pace and commodity prices fall, significant efforts to promote and facilitate private investment and increase productivity and competitiveness will be required. The global economic results for 2013 indicate that caution is advisable (MEF 2014b).

Although global activity strengthened during the second half of 2013, actual worldwide output grew at only 3 percent (IMF 2014a). Economic activity in the key trading partners of Peru is expected to improve during 2014 through 2015. IMF projects global growth to increase to 3.7 percent in 2014 and 3.9 percent in 2015, and these projections are in line with those used in Peru's official forecasts (MEF 2014b). Accompanying weaker-than-expected activity growth, imports into the advanced economies were weaker than previously anticipated.¹⁵ Prices for nonfuel commodities fell in the aggregate by 1.5 percent; metals were some of the hardest hit, with copper prices (Peru's largest export product)

¹⁴ GDP is forecast with a base year 2007.

¹⁵ Imports into the advanced economies grew only 1.4 percent during 2013.

falling roughly 5 percent (IMF 2014c). Commodity prices are expected to be volatile during 2014 and 2015, particularly for copper, for which a surplus currently exists on world markets; copper prices are expected to drop as much as 10 percent compared with current levels (MEF 2014b).

Peruvian per capita income has grown dramatically since 2000 (Table 3-2); although, the absolute per capita income still remains low compared to other major Latin American economies (MEF 2014b). In order to continue this type of income growth and to achieve parity with other Latin American economies, it is estimated that 15 years of sustained economic growth at 6 percent will be required. Sustaining this type of growth amid lower metal prices on international markets would require significant efforts to increase productivity and competitiveness through: (1) substantial improvements in human capital; (2) reduction of an infrastructure gap (3) simplification of government bureaucracy to promote investment and business development; (4) promotion of science, technology, and innovation; (5) diversification of economic activity; (6) further development of capital markets; and (7) attention to issues of environmental sustainability. These suggested actions are all relevant to the review of energy subsidies in addition to reducing poverty and increasing social inclusion.

Table 3-2. GDP per capita in major Latin American Economies (in current US\$)

Country	2000	2012	2013	2016	% Change 2016 vs. 2013
Chile	5,064	15,302	15,776	16,538	4.8
Brazil	3,717	11,281	11,173	11,979	7.2
Uruguay	6,917	14,792	16,421	17,716	7.9
Mexico	6,978	10,129	10,650	11,777	10.6
Colombia	2,479	7,938	8,031	9,300	15.8
Peru	2,018	6,323	6,541	7,350	12.4

Source: IMF, 2014b.

In addition to promoting a healthy environment for business and investment, Peru has undertaken efforts to maintain a fiscal surplus (MEF 2014b). Maintenance of such a surplus mitigates risks from sharp reversals of capital inflows, contingencies such as natural disasters (e.g., earthquakes), and temporary or permanent declines in commodity prices on international markets; and reduces the acceleration of currency appreciation (which reduces competitiveness and job creation). In order to achieve the desired goal of a fiscal surplus, efforts are being undertaken to expand government revenues to 18 percent of GDP (MEF 2014b). This will be achieved through broadening the tax base and reducing high levels of tax evasion and avoidance. Reaching these goals requires improvement of management, supervision and control by SUNAT (National Customs and Tax Administration) along with the implementation of new tax measures. These additional measures are expected to mitigate declines in export prices and generate additional resources for at least 0.5 percent of GDP annually over the period 2014–2016. Also, as a means of ensuring a fiscal surplus, Peru has undertaken efforts to reduce public debt, particularly the share of external debt. Public debt constituted 40 percent of GDP in 2005, but is forecasted to decline to 15.7 percent of GDP in 2016; external debt constituted 30 percent of GDP in 2005 but is expected to decline to 5.5 percent of GDP by 2016. Finally, Peru has undertaken steps to improve the quality of public spending through reform efforts of the public budgeting system. The Ministry of Economy and Finance (MEF) has instituted a performance budgeting system that links program funding to the quality of results achieved (MEF 2014b).

SOCIODEMOGRAPHIC CONDITIONS AND SOCIAL POLICY

In 2014 Peru is estimated to have a diverse population of approximately 30.5 million. The diversity is observed in socioeconomic indicators such as income, expenditure patterns, and other characteristics (INEI 2014a).

For all of Peru, average monthly real income per capita is 819 soles (in 2013 Nuevo Soles – the Peruvian currency), which is approximately US\$535¹⁶. However, the average per capita monthly real income varies in different population segments, with the lowest incomes being among the rural jungle and rural Sierra populations. Average monthly real per capita spending in 2013 in Peru was 620 soles (roughly US\$405), with approximately 17.4 percent expended on housing and fuel, and 12 percent on transportation and communication (INEI 2014a). However, this expenditure pattern is not uniform across Peru.¹⁷ Average monthly real per capita spending ranges from 168 soles (US\$110) in the lowest decile of expenditures to 1,689 soles (US\$1,105) in the highest decile.

In 2013, nearly 7.3 million Peruvian citizens or 23.9 percent of the population lived in poverty (48 percent of the rural population and 16.1 percent of the urban population).¹⁸ By region, poverty affected 34.7 percent of the sierras (52.9 percent rural), 31.2 percent of the Amazon (42.6 percent rural), and 15 percent of the coastal region (29 percent rural); Lima had the lowest rate, 12.8 percent. Extreme poverty affected 4.7 percent of the Peruvian population (432,300), with one of the highest rates found in the Amazon (6.9 percent).¹⁹

The risks of poverty can be clearly seen by examining the profile of poverty. For example, 50 percent of rural children under 15 years of age were in poverty because they reside in households that do not have adequate nutrition, access to schooling and medical services (INEI 2014a). Poverty is also correlated with language or “mother tongue” and it is also linked to ethnicity. Those who speak indigenous languages and self-report as being indigenous are more likely to be in poverty. The populations living in poverty tend to also have lower educational attainment. Of those living in poverty and 15 years or older, only 51.3 percent had completed more than minimum levels of education and 33.1 percent in extreme poverty had completed minimum levels. Fourteen percent of those in poverty are illiterate, while only 4.2 percent of those living above the poverty line were illiterate. The disparities between those living in poverty and those who are not are repeated in other key areas such as housing quality, access to commercial fuels and communications, and quality of medical care.

¹⁶ Real sole (S./) values for 2013 were converted to US\$(2013) using a PPP (purchasing power parity) conversion factor of 1.53 provided by the World Bank (<http://data.worldbank.org/indicator/PA.NUS.PPP>). The purchasing power parity conversion factor is the number of units of a country's currency that would be required to buy the same market basket of goods and services in international dollars (US).

¹⁷ Note that expenditures (spending) are imputed. As a result, particularly in the lower range of the distribution of expenditures, errors in the imputation process can result in values for expenditures that exceed real income. Further, in the lower deciles, there may be a mismatch between periods of earning income and spending (i.e., living off savings from a previous period during the current period).

¹⁸ Poverty in Peru is defined as the minimum necessary monthly per capita expenditure to provide a market basket of socially accepted food and nonfood necessities (INEI 2014a). Across Peru, in 2013, this level was 292 soles (approximately US\$190); however, this value varies by region.

¹⁹ Extreme poverty is defined as the inability to provide food which meets the minimum energy requirements for survival. In 2013, extreme poverty nationally was defined as a monthly per capita expenditure of 155 soles (US\$100), but in the Amazon region it was defined as 144 soles (US\$94).

In response to sociodemographic conditions in Peru, specifically the high level of poverty, a number of temporary programs were implemented beginning in 1990. However, these were not very successful (MIDIS 2012). Although overall poverty has been reduced in Peru, there remains a wide disparity between regions, resulting in a poverty gap that has been widening since 2004.

In October 2011 (under Law No. 29792), Peru reorganized a number of social programs into the Ministry of Development and Social Inclusion (MIDIS) to improve social inclusion²⁰ within Peru (MIDIS 2012). The formation of the MIDIS was in response to two factors: 1) poverty is not reduced automatically by economic growth, due to locational disadvantages in some areas, such as the rural sierras or the Amazonian jungle, where there is less access to roads, communications and electricity; 2) basic services such as education, nutrition, and health are not available equally to all Peruvians because these services have not been adapted to local conditions, and because of economic and cultural differences.

MIDIS was given several functions including the oversight of social programs administered by several other ministries in Peru, and the direct provision of services through five different social programs. These five social programs include (MIDIS 2012):

- 1) FONCODES, which provides for intermediate needs through the support of infrastructure development, access to basic services, and direct cash transfers to increase household income;
- 2) Qali Warma (originally PRONAA), is a program that supports the purchases of meals by parents and school teachers from specially prepared menus for nursery and primary schoolchildren taking into account local products and tastes;
- 3) Juntos, conditional monetary transfers to improve the economic capacities of households with pregnant women, disabled, children, adolescents or young people afflicted by poverty.
- 4) Cuna Mas, which is a program that works with children, under 3 years of age and living in poverty, in order to improve their cognitive, social, physical, and emotional development;²¹ and
- 5) Pension 65, which provides short-term direct payments to individuals over 65 who do not participate in other social programs.

Each program uses a different set of social indicators for program participation, and each has a different condition for participants to exit a program. Also, this set of programs addresses both supply issues related to lack of basic infrastructure (e.g., water, roads, and electricity) and demand issues raised by program participants.

As part of its oversight function, MIDIS has developed several cross-ministerial mechanisms for tailoring of services to local areas. For example, the Multi-Sector Commission headed by MIDIS coordinates efforts across the MEF, MINEM, Health (MINSA), Housing (VIVENDA), Agriculture (MINAG), Employment (MINTRA), and other agencies involved in infrastructure

²⁰ Social inclusion is a policy goal of the Government of Peru aimed at achieving universal access to high-quality public services and opportunities fostered by economic growth without regard to their ethnicity, place of birth or residence, or similar characteristics which may prevent full participation in the community (MIDIS 2012). This goal is used in the design of social and economic development policies which remove restrictions on Peruvian citizens.

²¹ Cuna Mas is available in the regions of Loreto, Ucayali, and Amazonas.

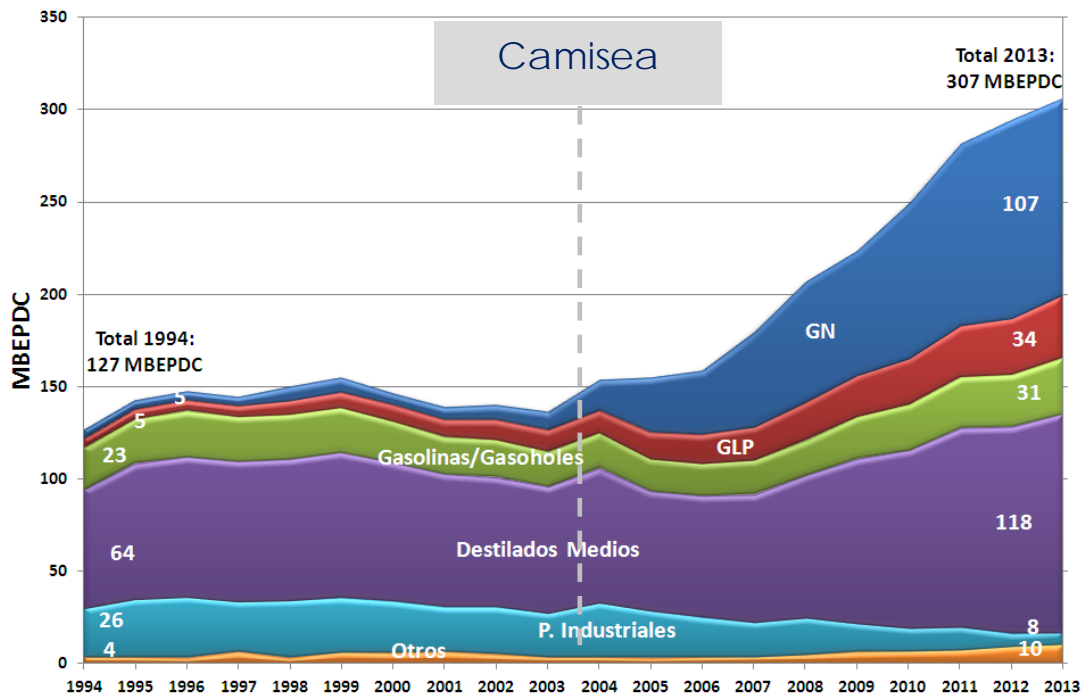
development (MIDIS 2012). To further ensure adaption of programs to meet local needs, MIDIS has instituted a process of service design tailored to local economic, social, and cultural needs. These program designs are tested in pilot programs. However, since MIDIS is relatively new (2011), all programs are not offered across all regions of Peru, and some regions currently do not receive any program services at this time.

4. ENERGY LANDSCAPE OF PERU

In this section, the energy landscape of Peru is presented, with an overview of energy resources, energy demand and forecast, the state of the power sector, and recent energy policies in Peru. This background provides a context for evaluation of the three fossil fuel subsidies selected by Peru, and for the development of recommendations by the peer review panel.

Since 2000, Peru has experienced rapid economic growth and macroeconomic stability, with the Peruvian economy expanding steadily at an average rate of 6 percent annually (InterAmerican Development Bank 2012). This robust economic growth has been accompanied by a steep rise in energy demand, particularly fossil fuel demand (see Figure 4-1). The production and supply of gas from Camisea in 2004 has been critical to increased use of natural gas in Peru. Diesel and middle distillate consumption has also increased over time, primarily for the transportation sector.

Figure 4-1. Fossil Fuel Demand Trends

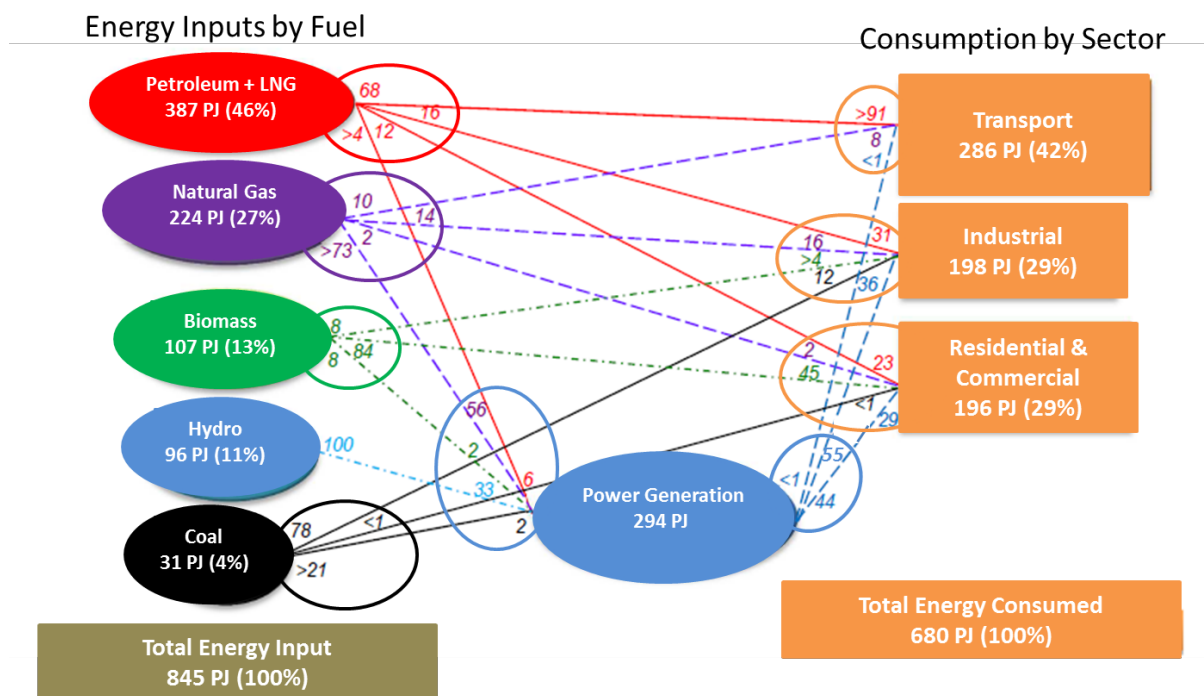


Key: MBEPDC = million barrels of crude equivalent; Gasolin/gasohol=gasoline/gasohol; Destilados Medios is medium distillates; GN=natural gas; GLP=liquefied petroleum gas, or LPG; P. Industriales =heavy industrial fuel oil; otros=others

Source: MINEM 2014

Currently, oil and its derivatives provide 39 percent of the energy supply; natural gas and liquids provide 33 percent; hydropower, 11 percent; and biomass, 13 percent—see Figure 4-2. With the discovery of the Camisea gas field, natural gas has become a new primary energy source for electric power generation, with more than 73 percent of gas being used for power generation and about 56 percent of power generation being gas-based. The 2012 energy matrix in Peru is shown in Figure 4-2.

Figure 4-2. Energy Matrix of Peru 2012.



Notes: On the left side, the numbers in open bubbles are percent values that the fuel supplies, and the sum of all numbers in each bubble add up to 100%. For example, 10% of natural gas is consumed in the transport sector, 14% in the industrial sector, 2% in residential and commercial, and 73% of gas is used for power generation. The total energy input by natural gas is 224 PJ, which is 27% of the total energy input. On the right side, the arrows show fuels that the sector receives. The open orange bubbles show the percent of total fuel received, and the sum of the numbers in each bubble is 100%. For example, the industrial sector consumes 198 PJ (29% of total consumption), and the sector receives 31% of energy from oil, 16% from gas, 4% by biomass, 12% by coal, and 35% by electricity. The electricity sector is shown in the middle, with inputs on the left, and outputs to sectors on the right. For example, hydropower is only used for power generation, and 33% of total power generated comes from hydro

Source: MINEM 2014

In the following subsections, Peru's domestic energy resources, its energy consumption and projected demand, and its current electricity structure are summarized. The last section has a summary of Peru's National Energy Policy and forecasts for future energy sector development under the new sustainable energy matrix (NUMES) for the Peru (R.GARCIA Consulting et al. 2012). These aspects are relevant as background for the three subsidies that the APRP reviewed.

ENERGY RESOURCES AND PRODUCTION

Peru is endowed with extensive energy resources—particularly, fossil fuel resources. The economy ranks seventh in crude oil reserves and fourth in natural gas reserves in Latin America (EIA 2013).

Oil

At the end of 2012, proven and probable petroleum reserves totaled over 1,301.1 million barrels with an additional 770.0 million in possible reserves. Prospective petroleum resources in areas without current exploration and development activities were estimated at 3,982.3 million barrels (MINEM 2012a). Peru's oil output has risen from 89,000 barrels per day in 2003 to 104,000 barrels per day in 2013 (BP Statistics 2014). With the recent increase in exploration activity, Peru is expected to see its oil production surpass 500,000 barrels per day by 2021 (NASDAQ, 2012). Nonetheless, Peru continues to import crude oil because its refineries are not designed to handle the domestically produced heavy oil.

Peru imports petroleum products primarily from the United States. In 2012, Peru imported 49,000 barrels daily, of which 80 percent was distillate fuel oil (EIA 2013). Refinery capacity is spread among six facilities located across Peru. Petroperú owns five refineries—at Talara, Iquitos, Conchan, Pucallpa, and El Milagro. Petroperú is a state-owned company that is involved in refining, transportation, trading, and distribution of fuel and other petroleum-derived products in Peru.²² PetroPeru is upgrading its largest refinery, at Talara, at a cost of about US\$3.5 million, to expand its topping capacity from 62,000 bbl/d to up to 96,000 bbl/d of crude oil;²³ reduce sulfur content in fuels (e.g., diesel to 50 parts per million); and process domestically produced heavy oil (Latin American Herald Tribune 2014). The sixth refinery is La Pampilla, owned by Repsol. LaPampilla refines 102,000 barrels per day. La Pampilla retains a 50 percent market share of refinery sales. In 2013, Repsol said that US\$800 million is needed to modernize its refinery and reduce sulfur content in fuel by late 2016 (See News 2013).

Natural Gas

At the end of 2012, the proven reserves of gas in Peru stood at 15.4 trillion cubic feet (Tcf), with probable and possible reserves totaling an additional 7.7 and 5.1 trillion cubic feet, respectively. The total prospective natural gas resources were estimated at 79.8 trillion cubic feet (MINEM 2012a). According to Pluspetrol, the company operating the Camisea gas fields and processing plant, its 2008 reserves assessment increased the estimated reserves of combined Blocks 88 and 56 (the Camisea project) to 13.4 trillion cubic feet (Hydrocarbons Technology 2012)

Peru has been a natural gas producer since the 1970s, initially in association with oil production. The first uses for natural gas were for “other” purposes, which included agriculture, on-site use in oil fields, flaring, or exports (Skeer et al. 2003). The initial natural gas infrastructure in Peru was developed by Maple Energy for its Aguaytía integrated gas production and electric generation project (Maple Energy 2009). It produces approximately 55 million cubic feet per day (MMcfd), which is sufficient to operate the associated 173 megawatt power plant (InterAmerican Development Bank 1996).

Currently production of gas for LNG exports and domestic gas consumption is from Blocks 56 and 88, collectively known as the Camisea Project. The Camisea project accounts for about 95 percent of current production (MINEM 2012a). Peruvian dry natural gas production has

²² http://www.ustda.gov/businessopps/tradeleads/Peru_TalaraRefineryModernization.asp

²³ [Ibid.](#)

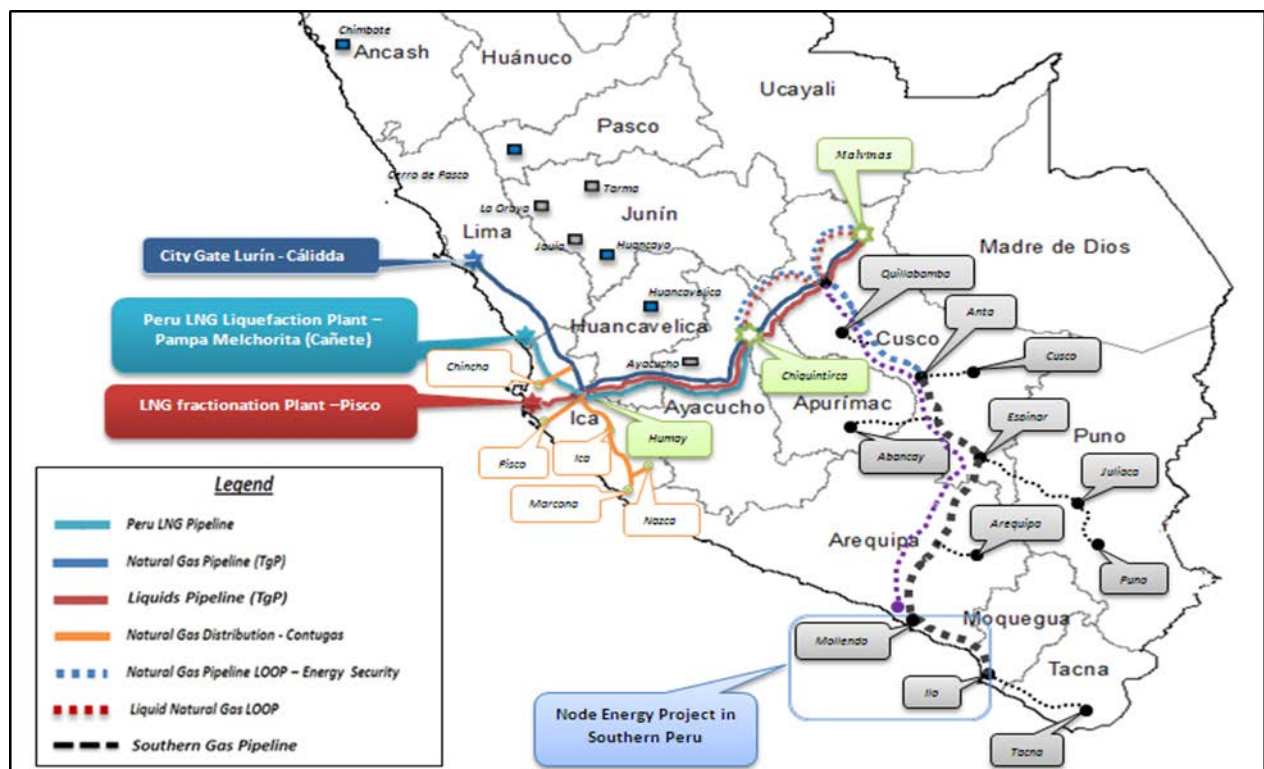
increased rapidly from 30 billion cubic feet (Bcf) in 2004 to 431 billion cubic feet in 2013, due to the development of the Camisea field (BP Statistics, 2014).

Royal Dutch Shell discovered the Camisea field in 1981, and the company began to commercialize the field with Mobil in 1996. However, the consortium withdrew because it could not agree with the government on the terms of project development (Vences 2006). The Camisea field is located inland, on the Amazon side of the Andes, and is now connected to the Pacific coast by a 550 km pipeline (Figure 4-3).

Subsequently, under Law 27133 Promoting the Development of the Natural Gas Industry (passed in November 1999), the project was split into two parts: one for the exploitation of the gas fields, and the other for the transportation of natural gas and natural gas liquids to market (Vences 2006). The law promotes the development of natural gas-related industries by stating that exports will be permitted only as long as proven reserves are sufficient to cover 20 years of domestic market demand. The law assured domestic consumers and the gas development companies that there are sufficient resources to meet both domestic and LNG export demand.

Camisea began production in 2004. The raw gas pipeline passes through the Malvinas processing plant, where liquids are stripped out of the gas stream. Dry gas is then piped to Lima and Callao via Pisco, and to the LNG liquefaction plant (215 billion cubic feet a year of capacity) in Pampa Melchorita by a parallel line. A liquids pipeline runs along the same route, delivering unfractionated liquids to a fractionation plant at the Port of Pisco (see Figure 4-3). The field development with its attendant infrastructure is the single largest private investment in Peru's history—from 2001 to 2014, about 3.4 billion dollars have been invested in the Camisea project (Perupetro 2014).

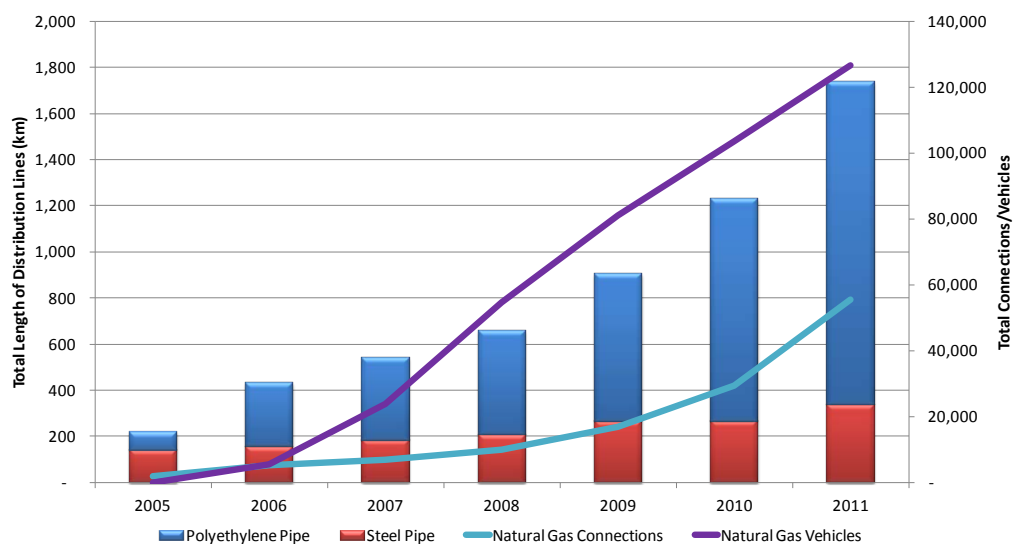
Figure 4-3. Natural Gas Development in Peru



Source: MINEM 2014

As the backbone of a distribution network began to develop, the number of connections (both industrial and commercial/residential) and the kilometers of pipe began to grow. This increase is largely due to government incentives, economic growth, and a substantial increase in gas-fired electricity capacity. The 20-year reserve provision of the Law 27133 also provides a strong incentive for companies to explore for and develop more natural gas reserves to meet domestic and export requirements. The government has encouraged widespread use of natural gas throughout the economy in residential, commercial, and transportation markets. Figure 4-4 shows the success of this ongoing “massification” of gas in Peru. The Spanish investment bank BBVA has estimated that approximately 20 percent of the Peruvian productivity gains can be attributed to the increased natural gas use, and it contributed an additional 0.6 percentage points to annual economic growth to the Peruvian economy, over the 2005–2010 period (Barco and Diaz 2011). Greater gas penetration has led to overall savings of US\$9 billion to the economy from 2005 to 2010.

Figure 4-4. Growth of Natural Gas Use in Peru



Source: Osinergmin, Boletín Informativo de Gas Natural 2011-II

Source: OSINERGMIN, 2011

In March 2012, Peru announced the construction of a \$16 billion, 1,000 km gas pipeline to southern Peru, in order to support industrialization of the southern region (see Figure 4-3) (Fox Business 2012). By 2020, the pipeline system is expected to reach Tacna near the Chilean border, and rely on production from undeveloped fields, such as lots 57 and 58 in the Amazon (MercoPress - South Atlantic News Agency 2012).

Other Resources

In addition to oil and gas, Peru also has coal resources. Proven reserves of coal are close to 11 million tonnes (92 percent anthracite), and there are prospective resources of up to 1 billion metric tons of total coal resources, mostly in northern Peru (MINEM 2012b; USGS 2006). Nonetheless, there is very limited exploration and production of coal in Peru—with only 4

percent of total energy production coming from coal. Most of the coal produced is used in industry (see Figure 4-2 above), and there is a 130 megawatt (MW) coal power plant operated by EnerSur since 2000 (MINEM 2012c).

Peru also has good renewable energy resources, with about 33% of total electricity produced coming from hydroelectricity. According to preliminary studies, technically usable potential with run-of-the-river projects totals about 70 gigawatts (GW) in the Atlantic basin and 8,700 MW in the Pacific basin (MINEM 2012b).²⁴ The highest potential for wind energy occurs along the Peruvian coast and the Peruvian Wind Atlas estimates wind potential that might exceed 77,000 MW and could be as high as 99,000 MW (MINEM 2012b). Over half of Peru (west of the Andes mountain range) receives some of the world's highest solar irradiance levels, which make solar parks for connection to the National Interconnected Electric System (SEIN) potentially feasible (MINEM 2003). In addition, solar can be used for the development of isolated systems (micro-grids) in rural areas, and for other applications, such as solar hot water heating (MINEM 2012b).

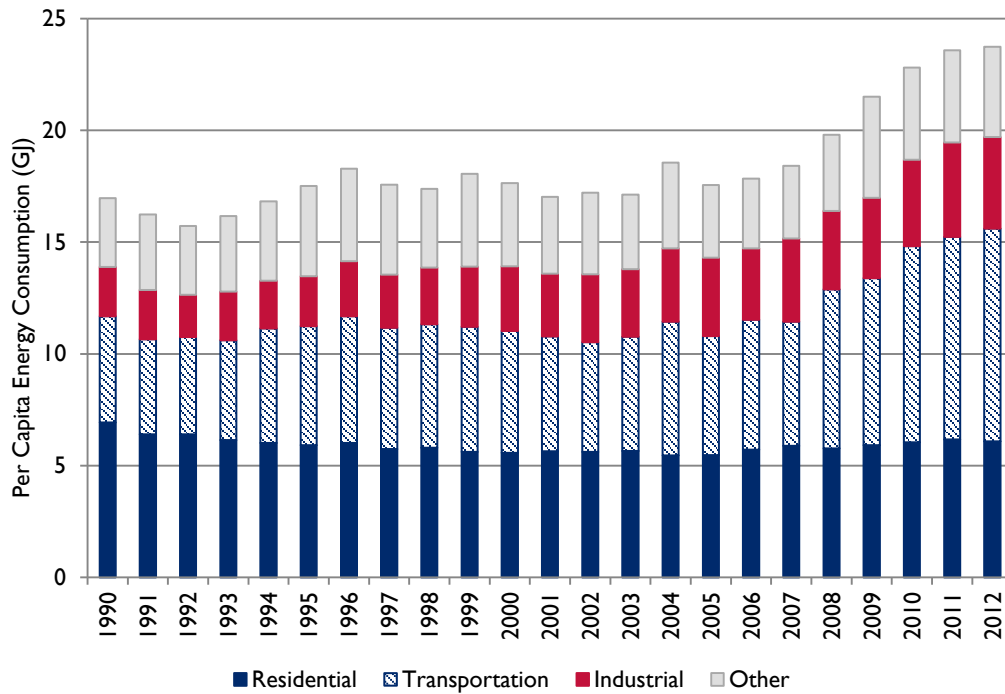
ENERGY CONSUMPTION AND DEMAND FORECAST

With an expanding economy and accessibility to commercial energy, total energy consumption has grown substantially since 2005. Between 2005 and 2012, Peru has experienced an average annual growth of total energy consumption of approximately 2.7 percent.

Figure 4-5 illustrates the evolution of the total energy consumption per capita since 1990 for the three major end-use sectors in the economy: residential and commercial, transportation, and industrial.²⁵ The observed patterns reflect economic growth, as well as an improving standard of living for the Peruvian population due to income growth per capita.

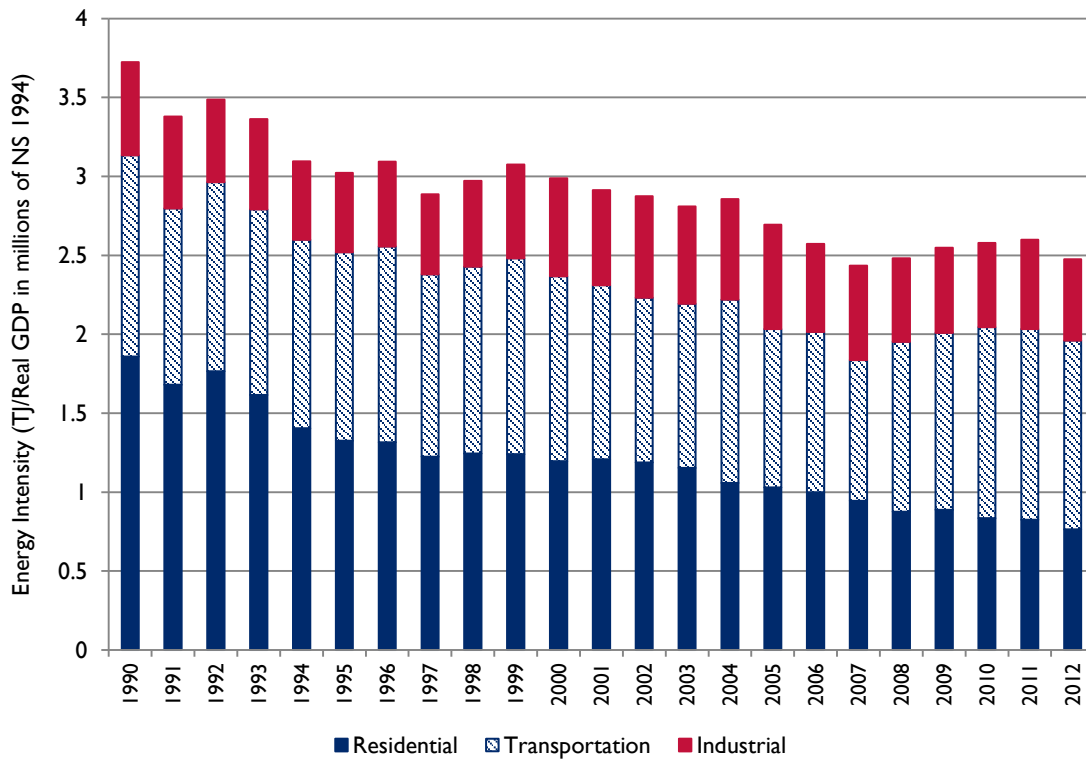
²⁴ These figures exclude restricted areas (e.g., reservations, etc.) and concessions where hydropower is already produced.

²⁵ The other sector reflects consumption in the public sector, agriculture and agro-industry, fishing, and metallurgy.

Figure 4-5. Per Capita Energy Consumption by Sector

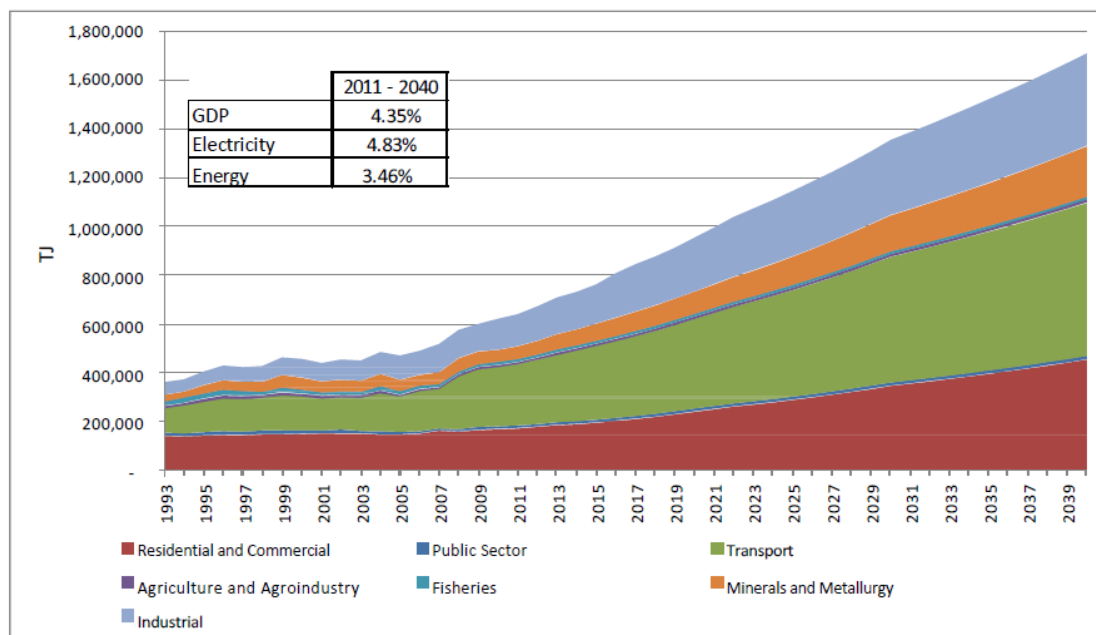
Source: Ministry of Energy and Mining (MINEM 2012d).

Offsetting the increasing energy consumption is the decline of Peru's energy intensity (or energy per unit of GDP). Figure 4–6 illustrates the historical pattern of energy intensity decline since 1990. Several factors are causing this decline. As economic development has occurred, the share of economic output contributed by the services sector has increased with the shift in economic activity away from Peru's traditional dependence on the mining industry. Furthermore, new investment in the economy has introduced more efficient technologies. Finally, the shift toward more efficient commercial fuels in all activities has contributed to these declines. So although, total energy consumption in the aggregate is increasing with economic growth, less energy per unit of output (as measured by GDP) should continue.

Figure 4-6. Energy Intensity by Sector

Source: Ministry of Energy and Mining (MINEM 2012d).

As for future energy demand, recent projections on Peru's new energy matrix (NUMES), suggest that demand will more than double by 2040, with the average annual growth rate over the period for energy being 3.46 percent and for GDP, growing at an annual average of 4.35 percent (R.GARCIA Consulting et al. 2012).

Figure 4-7. Historical and Projected Demand for Energy in Peru

Source: R.GARCIA Consulting et al. 2012

ELECTRICITY IN PERU

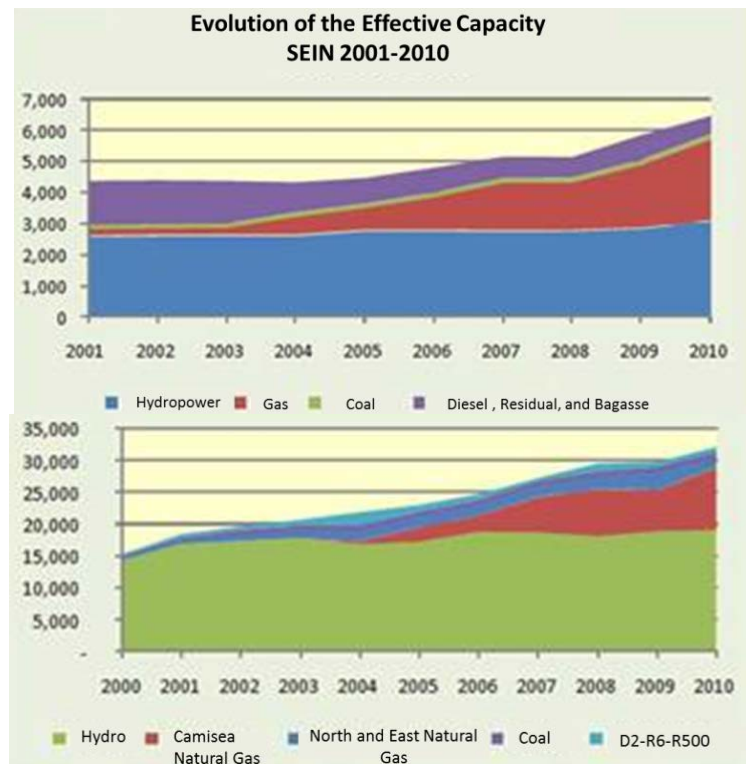
Peru has a relatively well-developed electricity market infrastructure (APEC 2013). Table 4-1 summarizes some key indicators of the Peruvian electricity sector.

Table 4-1. Main Indicators of the Electricity Market 2011

Mercado Eléctrico / Electricity Market		
Número de clientes finales	Number of final customers	5,5 millones (millions)
Consumo final de electricidad (Venta final)	Final Electricity Consumption (Final sale)	32 TWh
Facturación por Venta Final	Billing upon Final Electricity Sale	2 780 millones US\$ (millions US\$)
Precio medio de electricidad	Average Electricity Price	9 ctvo US\$/kWh
Producción de electricidad	Electricity production	36 TWh
Hidroeléctrica	Hydropower	58 %
Termoeléctrica	Thermal Power	42 %
Potencia Efectiva	Effective Power	7 GW
Hidroeléctrica	Hydropower	47 %
Termoeléctrica	Thermal Power	53 %
COES-SEIN del Mercado Eléctrico / COES-SEIN of the Electricity Market		
Potencia Efectiva	Power Capacity	6 GW
Máxima Demanda del SEIN	Maximum Demand of SEIN	5 GW
Margen de Reserva del SEIN	SEIN Reserve Margin	31 %

Source: MINEM 2012b, pg. 37.

Figure 4-8 shows the trend of capacity growth in Peru from 2001 to 2010. With the development of Camisea, gas-based capacity has increased significantly over the last decade. In terms of generation, gas is also becoming dominant, accounting for 56 percent of power generated (see Figure 4-2). By the end of 2012, Peru's interconnected power generation capacity stood at 7.62 GW (BNAmericas 2013). The growth in gas-based power has resulted in a concentration of about 75 percent of the generation capacity in the central part of Peru, in contrast to northern and southern areas.

Figure 4-8. Evolution of Capacity (Top; MW) and Generation (Bottom; GWh) at SEIN

Source: R.GARCIA Consulting et al., 2012.

Natural gas (from Camisea Lot 88) is supplied to power plants at regulated prices, which are lower than other economies. Power prices are therefore comparatively lower (R.GARCIA Consulting et al. 2012). For example, in December 2010, the gas was supplied to power plants in Peru at \$2.58/MMBtu (\$1.65/MMBtu at the wellhead), whereas Henry Hub prices were at \$4.25/MMBtu. This has further incentivized gas-based power in Peru. Even so, Peru has recently indicated that it is planning to invest more in hydroelectricity and other renewables (BNAmericas 2013).

Demand growth for electricity has grown at an average rate of 7 percent between 2004 and 2011 or an average of 1.74 Twh annually (MINEM 2012b). R.GARCIA Consulting et al. (2012) have projected the demand for power to increase nearly fourfold and generation to increase more than threefold over the next 30 years. Central Peru is expected to continue to have the largest amount of capacity, although northern and southern Peru are expected to have the greatest growth in capacity. Renewable energy is projected to rise to nearly 15 percent of total capacity by 2040, compared with less than 4 percent today. Thermal capacity (mostly gas-based) is expected to increase significantly, nearly quintupling its current capacity.

In 1992, Peru's electricity sector went through a change that separated electricity generation, transmission, distribution, and regulation and created OSINERGMIN as the regulator. Electricity is generated by private and state-owned companies. Private companies also own transmission systems, which are regulated by OSINERGMIN. There were two main power grids in Peru covering the northern and southern parts of Peru. In 2001, the National Interconnected System (SEIN) was created by joining the northern and southern power systems through an interconnector.

Distribution of electricity to Lima and other urbanized areas is through private companies; however, the rest of Peru, including rural areas, receives electricity through public distribution companies (World Bank 2013). Large electricity distributors operate in concession areas around high-density population centers and are connected to the SEIN; smaller ones operate in isolated areas and are referred to as Isolated Distribution Centers. SEIN does not provide electricity to Peru's rural territories since it is not technically or economically feasible to extend SEIN into these isolated areas.

Despite Peru's electricity reforms, one of the biggest challenges to Peru's electricity sector is the very low accessibility of electricity in rural areas and the untouched potential for renewable energies, such as wind and solar, in these areas. Figure 4-9 shows Peru's SEIN power grid, indicating the lack of electricity infrastructure in the Amazon region. In 2010, SEIN accounted for 98.1 percent of the generation, and the remaining 1.9 percent was generated in isolated systems. The public distribution companies are managed by the National Fund for Financing the Entrepreneurial Activity of the State (FONAFE).

Figure 4-9. Electricity Infrastructure in Peru

Source: R.GARCIA Consulting et al., 2012.

As of 2010, approximately 38 percent of Peru's rural population of 8 million (979,476 households) did not have access to electricity, for one of the lowest rural electrification rates in Latin America (MINEM 2010b) Table 4-2 shows the various types of energy used by households in the rural territories of Peru (ESMAP 2010).

Table 4-2. Percentage of Households that Use Different Energy Types (by Region)

	Coastal Regions			Andean Regions			Amazon	All Regions
	North	Central	South	North	Central	South		
Grid Electricity	35	60	71	22	52	44	18	39
Fuelwood	85	74	68	94	92	64	95	84
Dry cell battery	71	51	44	78	66	74	91	74
Kerosene	71	32	31	71	44	52	73	57
Candles	47	53	60	56	69	66	46	60
Car battery	31	21	13	9	8	7	15	11
LPG	28	63	53	5	17	10	7	14
Ag. residue	8	7	5	5	18	13	3	11
Dung	0.4	0.5	15	3.6	26	65	0.1	25
Solar PV	0.3	0.1	0.1	0.4	-	0.9	1	0.5
Small generators	0.9	1	-	-	1	0.2	0.9	0.6
All households (000s)	156.4	75.3	27.8	362.0	634.2	655.0	383.4	2,204.2

Source: ESMAP, 2010.

Peru has undertaken efforts to expand service through development of renewable energy in areas isolated from the grid. Starting in 2005, the government invested an average of US\$40–50 million annually for rural electrification (World Bank 2013). These investments were carried out by the Executive Office for Projects (DEP; a division of MINEM), which planned, designed, and built the rural electrification projects. After the construction phase was completed, DEP handed the rural electricity systems to the state-owned distribution companies, or to ADINELSA, a “specially created state-owned asset-holding company that manages more isolated and less profitable rural systems under operation contracts with state-owned companies, or municipalities.” (World Bank 2013). The government placed high priority on these rural electrification projects, realizing that lack of electricity in rural areas leads to lower quality of life, poor health conditions, poor education, and limited opportunity for economic growth. Most of the investment in rural areas has been through government funding (MINEM 2012b).

PERUVIAN ENERGY POLICY 2010–2040

The large resources and high production of domestic natural gas have led to new policies to promote its use. The new policies are broadly aimed at expanding the economy’s energy matrix and improving the energy system’s efficiency. The new policies also intend to address several other energy constraints, including: the slow development of hydropower; unequal geographic concentration of thermal generation capacity (mostly in Lima); congestion within the only pipeline carrying gas from Camisea; inefficiency in the SEIN infrastructure for power transmission to other parts of Peru; limited entry of renewable energy sources; and other issues that were endangering the energy system’s stability and reliability (InterAmerican Development Bank 2012). More broadly, the energy challenges in Peru are shown in Table 4-3.

Table 4-3. Energy Challenges in Peru

Sector	Challenges
General	<ul style="list-style-type: none"> • Rethinking the role of the State. • Integrated planning of the energy sector. • Sustaining exploration and production activity. • Improvement of the regulatory framework. • Tariff policy that does not discourage the rational and efficient use of energy.
Electricity	<ul style="list-style-type: none"> • Diversification of generation and contribution of different sources of primary energy. • Integrated development of energy sources and the transmission infrastructure. • Greater coverage of the total electricity supply, particularly to the rural population.
Hydrocarbons liquid	<ul style="list-style-type: none"> • Develop and adapt the transportation infrastructure and logistics. • Adjust the policy for prices of derivatives, including quality of the products.
Natural gas	<ul style="list-style-type: none"> • Development of new markets away from the centers of production and infrastructure requirements of large gas transport. • Affordable access to energy with greater natural gas coverage, including in the transport sector. • Sustainable development of the petrochemical industry.
Renewable energy	<ul style="list-style-type: none"> • Expansion of transmission and distribution systems. Deepen the knowledge of the resource potential of RER by facilitating access to information. • Consider the inclusion of the environmental externalities in pricing of fossil fuels.
Energy efficiency	<ul style="list-style-type: none"> • Human resource and financial constraints on meeting future demand requirements. • Developing training activities, training in the different sectors of consumption. • Development of programs / information campaigns. Promotion of new technologies such as smart grid and distributed generation. • Articulation of how EE contributes to the mitigation of climate change.

Source: R.GARCIA Consulting et al., 2012

In 2010, Peru established a National Energy Policy for 2010–2040 that draws on the guidelines of the Strategic National Development Plan–“Plan Peru 2021” (MINEM 2010a). The vision and the policy objectives outlined in the National Energy Policy are driving choices of infrastructure development, and policy review and implementation. The policy calls for the development of an energy system that meets demand, reliably and efficiently, while promoting sustainable development, and supports research and continuous technological innovation.

The National Energy Policy includes nine objectives of which several have a bearing when reviewing existing energy subsidies (MINEM 2010a). The objectives outlined in the policy include:

- Develop a diversified energy matrix with an emphasis on renewable sources and energy efficiency.
- Promote a competitive energy supply through achieving an adequate infrastructure, and establish pricing mechanisms that are transparent and limit the impact of price volatility of international markets.
- Assure universal access to energy supplies with adequate infrastructure, meanwhile providing temporary energy subsidies to low-income segments of the population.

- Develop greater levels of efficiency in the energy supply chain and energy end uses.
- Achieve self-sufficiency in production of energy resources.
- Minimize the environmental impact of the energy system within a framework of sustainable development.
- Promote development of natural gas supplies along with greater use in the residential, commercial, transportation, and industrial sectors as well as efficient power generation.
- Strengthen institutions and transparency in the energy sector.
- Integrate with energy markets in the region, resulting in increased availability and reliability of low-cost energy.

Success of the Peruvian National Energy Policy in achieving its objectives will require a healthy economy and a dynamic energy system. Both factors will directly affect efforts to reform the three subsidies under consideration by the APRP.

PART 2: APRP KEY FINDINGS AND RECOMMENDATIONS

Part 2 of the report summarizes the background, key findings and consensus APRP recommendations for each of the three subsidies selected by Peru for review. These findings and recommendations are intended to support Peru in its ongoing reforms on fossil fuel subsidies. After careful consideration, APRP developed recommendations that are not too prescriptive, and the recommendations represent a compromise position that all APRP members agreed to.

For each subsidy, some lessons learned and best practices from other economies are also provided as possible ideas for Peru to consider. The recommendations, as well as the lessons learned and best practices, should be further analyzed by Peru to develop specific and strategic reform options.

Finally, this part of the report ends with a brief conclusion discussing the way forward for Peru.

5. PREFERENTIAL VAT AND ISC TAXES IN AMAZON REGIONS

To promote sustainable development of, and investment in, the Amazon Region, Peru in 1998 provided a tax exemption from the Selective Sales Tax Law (VAT) and the ISC (Selective Consumption Tax) for fossil fuels sold within the region (CoRP 1998). The preferential tax treatment of fossil fuels was part of a much larger tax package that included 14 tax provisions favorable to businesses and consumers in the region (Apoyo Consulting 2012). The ISC applies only to fossil fuels, whereas the VAT exemption applies to other activities and taxes besides fossil fuels. Through a series of changes to the original decree, the preferential tax treatment for the entire Amazon has been extended through to 2048, without any specific review for the effectiveness of the tax treatment in achieving the stated goals.

HISTORY AND CONTEXT

The preferential VAT has had a long and varied legislative history. First passed in 1998, Law 27037 (Promotion of Investment in Amazonia) waived the VAT and the excise tax on fuels for several areas, including the Departments²⁶ of Loreto, Ucayali, Madre de Dios, Amazonas, and San Martin regions (Apoyo Consulting 2003). Table 5-I shows all of the districts that were affected by the preferential VAT and ISC in the Amazon region. Gas and oil derivatives sold in Loreto, Ucayali and Madre de Dios were totally exempt from the ISC and VAT. For Madre de Dios, the ISC paid for fuel purchases outside the Department (e.g., from Cusco) were to be returned to the Department.

Table 5-I. Districts Affected by the Preferential VAT and ISC in Peru

Department	Province	District	Department	Province	District
Loreto	All	All	Huánuco	Leoncio	All
Madre de Dios	All	All		Puerto Inca	All
Ucayali	All	All		Maranon	All
Amazonas	All	All		Pachitea	All
San Martin	All	All		Lucanas	Monzón
Ayacucho	Huanta	Sivia		Huánuco	Churubamba
	Ayna	Ayahuanco			Santa Maria del Valle
	La Mar	San Miguel			Chinchao
		Santa Rosa			Huánuco
Cajamarca	Jaén	All			Amarilis
	San Ignacio	All		Ambo	Conchamarca
	Calca	Yanatile			Tomayquichua

²⁶ The “Departments” are effectively the different States within Peru.

Department	Province	District	Department	Province	District
Cusco	La Convencion	All	Junín		Ambo
	Paucartambo	Kosñipata		Chancamayo	All
	Quispicanchis	Camanti		Satipo	All
		Marcapata	Pasco	Oxapampa	All
Puno	Carabaya	Coaza	Huancavelica	Tayacaja	Huachocolpa
		Ayapata			Tintya Puncu
		Ituata	La Libertad	Pataz	Ongon
		Ollachea	Piura	Huancabamba	Carmen de la Frontera
		San Gaban			
	Sandia	San Juan del Oro			
		Limbani Nsapato			
		Yanahuaya			
		Purah			
		Alto Inambari			
		Sandia			
		Patumbuco			

Source: Apoyo Consulting, 2003

In 2000, a period of tax reform was initiated that lasted until 2007. During this period, a legal framework was established to allow for the identification of tax exemptions and more-transparent reporting of expenditures for tax exemptions (Apoyo Consulting 2012). During this period, the government started to phase out preferential tax exemptions in the Amazon. Legislative Decree No. 978 in 2007 established a substitution program where public funds would be transferred to the Amazon region in lieu of tax exemptions. The program was to start in 2009 and included the elimination of tax exemptions for fossil fuels. In December 2007, this program was postponed until 2012, and ultimately the law was revoked in 2011, with the fossil fuel exemptions being extended until 2048 by the Peruvian Congress. The extension was precipitated by a Constitutional Court ruling that invalidated the way the VAT had been removed—i.e., changes to the VAT and ISC exemptions needed to be done by the Congress and not by Executive actions. While the Court only considered the method by the subsidies was removed (and not the validity of the removal of the exemptions themselves), Congress decided to keep the exemptions till 2048. Congress also felt that the promised transfers of public resources was not been made to the region, and that loss of the exemptions would result in a higher cost of living for people living in the Amazon region.

The extension of the preferential VAT exemption for fuels has been questioned by some in Peru on several grounds. First, the fiscal burden due to forgone tax revenues to Peru can be substantial. As indicated in Table 5-2. This burden is expected to range from slightly from \$160 million to close to \$180 million per year in 2014 and 2015. The total exemptions are expected to cost from \$1.15 billion to \$1.25 billion in 2014 and 2015. This fiscal burden also represents a potential loss of welfare for those outside of the Amazonian region. In order to have the same levels of government services, the rest of the Peruvian population must pay higher taxes.

Table 5-2. Lost Tax Revenues from VAT and ISC Exemptions on Sales of Fuels in the Amazon (US\$ thousand)

Tax	2010	2011	2012	2013	2014	2015
VAT	994,147	706,000	876,316	863,515	1,065,639	1,151,333
Exemption for sales of fuel from petroleum producers to retailers or final consumers in the Amazon	18,728	22,092	26,871	5,514	79,285	85,773
ISC	61,464	72,330	73,576	77,810	85,221	93,394
Exemption for sales of fuel from petroleum producers to retailers or final consumers in the Amazon	61,464	72,330	73,576	77,810	85,221	93,394
Total VAT + ISC	1,055,612	778,330	949,892	941,324	1,150,859	1,244,727
Total hydrocarbon only	80,192	94,422	100,447	83,324	164,506	179,167
Hydrocarbon percent	7.6 %	12.1 %	10.6 %	8.9 %	14.3 %	14.4 %

Source: Ministry of Economics and Finance

Second, anticipated development in the Amazon has not materialized despite the large transfer of funds. The total set of 14 exemptions results in a potential loss of revenue equivalent to an estimated 0.46 percent of GDP from the Peruvian economy (Apoyo Consulting 2012). Notwithstanding this subsidy, the economic growth rates in some of the Departments in the Amazon region continue to be among the lowest in Peru (See Figure 5-1, compared with Table 5-1). Furthermore, there is no direct evidence that the growth in the Amazonas and San Martin (which is higher than the recent Peru-wide averages) is due to the VAT exemption.

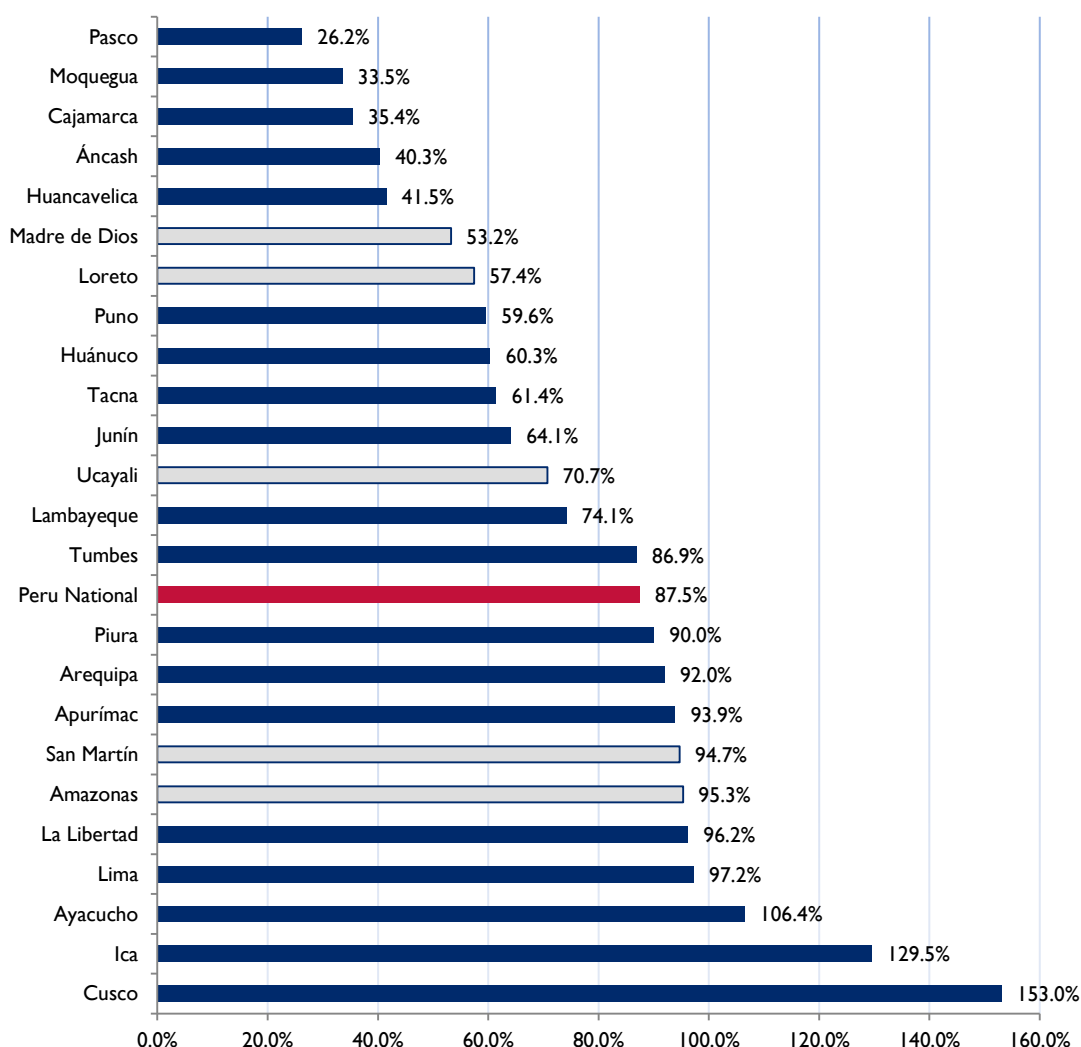
Third, there are variations among the different areas of the Amazon region, and there are other regions of Peru with lower economic growth levels than the Amazon that have no such support. GDP growth in Madre de Dios and Loreto, for example, has been lower than other Amazon regions, while the regions of Moquegua and Ancash have had quite low growth and yet they do not receive the VAT benefits.

Fourth, the average annual flow of private investment from 2007–2011 into the Amazon region was less than US\$1.0 billion, compared with regions where private investment ranged from more than US\$1.5 billion to more than US\$2.2 billion annually (Apoyo Consulting 2012). Lower levels of private investment led to an average annual growth of formal employment of only 1.7 percent during 2000 to 2011 compared with other regions where formal employment grew at an average annual growth rate of 3.9 percent. Furthermore, poverty rates for those living in the Amazon region averaged 40 percent, while for all of Peru the rate had fallen to 34 percent in 2009 (Paurinotto 2011). Figure 5-2 provides the share of the Peruvian population and the percentage of that share in total poverty for these divisions.

Fifth, these tax exemptions benefit the richer population more than those who are poor. The recipients of the fossil fuel subsidy are families (e.g., consumers of transport services and liquid fuels) and firms (e.g., refiners, wholesalers, marketers, and retailers) that use liquid fossil fuels. These users are exempt from the sales taxes. As such, only 4 percent (in Madre de Dios) to 36 percent (in Loreto) of the total population benefit from the overall preferential tax exemptions. Further, in 2011, nearly 30 percent of the overall benefits were

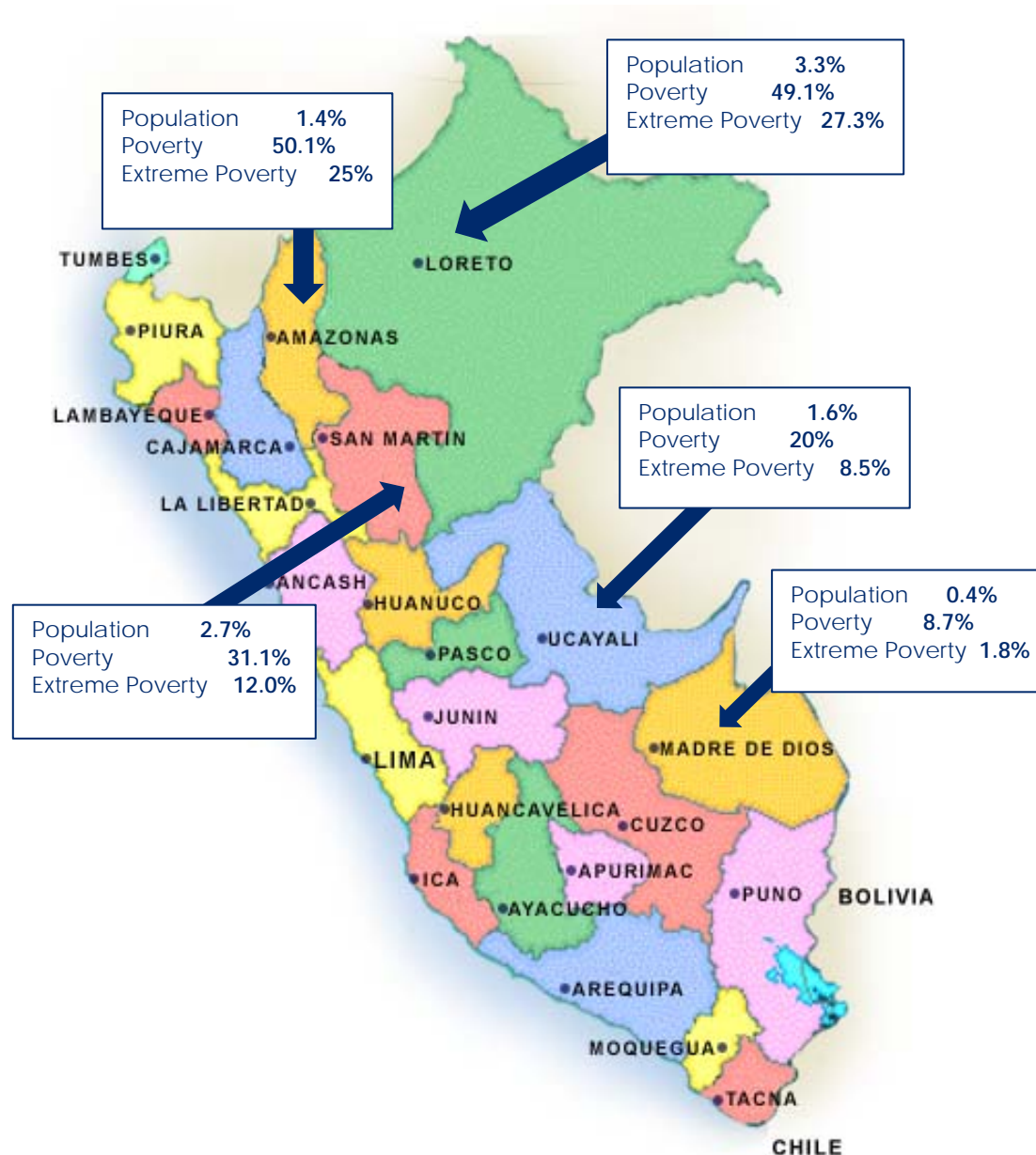
captured by the uppermost income decile while only 0.7 percent of the benefits were captured by the lowest income decile.

Figure 5-1. Cumulative Increase in GDP Growth, 2002–2012, by Department



Source: INEI Regional Database 2014.

Finally, the tax exemptions for fossil fuels have produced some unintended consequences. A black market for fuels has developed in regions bordering on the Amazon. Based on data from the National Technology and Statistics Institute (INEI), the demand for fuel in Amazon region should be equivalent to about 1 percent of the gross value of production (GVA) due to formal production activities that are no more energy intensive than other regions of Peru. However, the actual demand for fuel in the region is much larger, equivalent to 7 percent of the gross adjusted value (GVA) of the area (Apoyo Consulting 2012). This information suggests that there is a significant component of the demand for fuels that is not intended for household consumption or use in formal enterprises. Further, in addition to a black market, much of the Peruvian population believe that the tax exemptions have contributed to illegal mining, logging, and drug trafficking activities; for example, kerosene is used to produce cocaine (Apoyo Consulting 2012).

Figure 5-2. Population and Poverty in Key Departments in the Amazon Region

Notes: Population data are from 2010. Poverty rates are for 2010, and data on extreme poverty data are from 2009.

Source: Data from INEI 2014a. Map is courtesy of SE@CE (Sistema Electrónico de Contrataciones del Estado). Map is available at: http://app.seace.gob.pe/mon/ProcesoReporteGrafPb.jsp?tipo_cons=1&anhoentidad=2006&tipo_cons_sub=7

KEY FINDINGS ON PREFERENTIAL VAT

The VAT exemption for the Amazon regions is ineffective. As demonstrated above, the exemption is not meeting the stated goals of promoting development in the region.

The exemption has led to wasteful and inefficient consumption of fossil fuels. A black market exists for fuels in the regions bordering the Amazon regions, which have the VAT exemption. The suspicion that the subsidy benefits illegal mining, logging, and drug trafficking further adds to the problems.

The exemption tends to benefit the higher income population, resulting in perverse incentives in the Amazon region. The exemption has mostly benefited

traders and those who consume higher quantities of fuel. It has also resulted in unintended consequences and perverse incentives.

The VAT exemption has not met its objective of economic development of Amazon region. Despite exemptions that have been in effect since 1998, the region's output, as a whole, continues to lag compared to other areas of Peru where no such exemption is provided. At the same time, there are regions of Peru that lag behind the Amazon region and do not receive these exemptions.

The VAT exemption results in high fiscal costs to Peru. As Table 5-2 in the foregoing discussion shows, the VAT exemption has cost or will cost Peru from US\$0.78 billion to US\$1.24 billion a year. However, the cost of hydrocarbon-related exemptions is between 8 percent and 14 percent of those total costs.

END GOAL/VISION

While the APRP recognizes the need of continued support to “vulnerable” groups, the current blanket tax exemption for fuels in the Amazon region should be eliminated. Further, the exemptions should be replaced with targeted social and regional developmental programs for schools, hospitals, transportation, and other infrastructure. The removal of this fossil fuel subsidy is consistent with the energy, economic, and fiscal policies of Peru. The substitution of targeted social and developmental programs would provide a more effective means of meeting the social policy and development unique to the Amazon region.

RECOMMENDATIONS ON PREFERENTIAL VAT

The APEC review team recommends the following set of actions for consideration by Peru. These recommendations are consistent with the goal of eliminating ineffective fossil fuel subsidies while supporting Peru's goals of promoting sustainable and socially inclusive economic growth and development. These recommendations have the added benefit of broadening the tax base and reducing the administrative costs resulting from an overly complex tax system.

Recommendation 1: Remove fossil fuel VAT exemption as an initial step toward a broader tax reform initiative. A gradual removal of the fossil fuel tax exemptions in the Amazon could serve as an impetus for a more comprehensive tax reform package. Such tax reforms should broaden the tax base, and thus stabilize fiscal revenues. The added revenues would allow for expanded and targeted public spending in the Amazon region.

Recommendation 2: Create regional infrastructure and social equity funds for targeted social and infrastructure programs to meet the needs of low-income individuals as well as for development of the Amazon region. Investment needs for the required development in the Amazon region are much more than the value of fossil fuel tax exemptions. These investment needs may require expansion of existing programs (such as FONCODES) or creation of an infrastructure and social equity funds which could support the development of basic infrastructure. The Amazon region is at a locational disadvantage, but it is rich in resources. Therefore, the region needs to experience a clear benefit from resource extraction. The revenue sharing from resource extraction may allow additional investment funds to build infrastructure and supply other basic social needs. Once a transportation network is developed, the region will be able to interact with major Peruvian cities and neighboring regions or economies. Further, human capital developed through

enhanced educational opportunities can also lead to economic development and an improved quality of life. Finally, the provision of such basic needs as health services through mobile clinics can contribute to improved productivity.

Recommendation 3: Develop a specific plan for direct public investments. The Amazon region will need to have a clear plan for direct public investment. The plan should provide a set of clear actions with committed resources and timeframes for completion. The development of such a plan will require involvement of all stakeholders to ensure that the plan addresses the needs of the region and to ensure the commitment from all involved parties. Further, an institutional framework will be required to facilitate formulation of the plan. Also, this framework will need the capabilities to coordinate, implement, and provide oversight during implementation. The investment plan could also explore the possibilities offered by public-private partnerships (PPP). Experiences from the rest of the world, particularly in Asia, show that PPPs can provide clear and transparent procedures, rules, and policies to attract private investments. The private sector will not engage in high-risk development projects without such a structure.

Recommendation 4: Use positive outreach and communication methods implemented in FISE for newly targeted social and development programs to be implemented during the phase-out of the tax exemptions for fossil fuels. The experience gained from the FISE and other social programs could be useful to tailoring social programs to the specific circumstances of the Amazon. The established presence of social workers in the Amazon region could play an important role in establishing and identifying the targeted beneficiaries of these social programs. Similar communication methods could also reduce political resistance to the eliminating the tax exemptions.

LESSONS LEARNED AND BEST PRACTICES

In this section, some of the lessons learned from the review of other economies are listed.

Direct Cash Transfers (DCTs) to Targeted Populations

Rather than broad tax exemptions for fossil fuels, Peru may want to consider direct or conditional cash transfers to targeted populations. Kojima (2013) argues that targeted direct cash transfers are a much more effective mechanism for supporting specific sectors and low-income population: “Unlike targeted price subsidies, which can have large leakage and introduce market distortions, cash transfers leave market forces largely alone while enabling the poor to cope with multiple shocks” (Kojima 2013, p.31). For example, Bangladesh, China, and the Philippines provide cash subsidies to their agriculture, public transport, and fishery sectors. Mozambique provides transport vouchers, while low-income households in Thailand are provided free rides on non-air conditioned public buses and third-class trains. A key challenge for such direct cash transfers is identifying the beneficiaries and ensuring that they receive the subsidies on time.

A key case study for cash transfer for preventing oil price increases is Indonesia’s delivery of about US\$11 monthly to 19 million households to compensate for the rapid increase in the price of gasoline, diesel, and kerosene in 2005. The one-year subsidy allowed for the poor and the near-poor to adapt to the high prices. Similar cash transfers were made for nine months in 2008, in response to another price increase. According to Kojima (2013), a number of studies on the Indonesia cash transfer have shown that about two-thirds of the total benefits went to the bottom 40 percent of the population, which resulted in improved

education, labor, and health outcomes. Iran, on the other hand, provides a lesson on what not to do, when it provided cash transfers to all its citizens by taking out loans from the Central Bank and other revenue sources (Kojima 2013).

A more recent example for DCT is in India. Estimates of total subsidies provided for food, fertilizer, and petroleum by the government for the year 2012–2013 were approximately 1.8 percent of the economy's GDP (Sharma 2013). Although these subsidies are intended to benefit the economically weaker sections of the society, a significant proportion of these subsidies do not reach the targeted beneficiaries.²⁷ Several pilot projects were conducted in India to test the concept of direct cash transfers, wherein the government of India provided the local district administration with the subsidy amount, which then transferred it to eligible beneficiaries. Over the last few years, the Indian government has initiated a scheme of creating a Unique Identity (UID) number for each citizen and linking it to direct cash transfer schemes of various subsidies and social security endowments. In 2013, the Indian government introduced a Direct Cash Transfer Scheme based on the UID numbers. This scheme allowed beneficiaries to receive the subsidy, in the form of cash transfers directly to their bank or post office accounts, for the purchase kerosene at the typical market price. One of the main goals of the direct cash transfers was to guarantee that the benefits would be transferred directly and electronically into the beneficiary's bank accounts, reducing delays and removing the possibilities of pilfering and forgery (Sharma 2013).²⁸

In conclusion, targeted and direct cash transfers are more cost effective and can help many poor families gain access to clean fuels, as well as access to other social services, and thus increasing school enrollment, development of human capital, and regular medical treatment. The programs have expanded rapidly in many economies over the past decade. If the focus in Peru is to provide Government support to poor people in the Amazon region, then direct cash transfer options are preferable to a blanket VAT exemption.

Alaska's Air-Based Transportation

The Amazon regions of Peru are vast and relatively sparsely populated. The APRP was informed that movement of people and goods to schools and hospitals was a considerable problem in the Amazon due to the time it took to do so. An example of a similar situation is the isolated communities in Alaska. These communities are only reached by arduous sea or overland travel where few or no roads exist.

The solution in Alaska was for the government to subsidize small regional airlines that flew to these communities under contract. In that way inhabitants of those communities could get to larger communities for education and health care.

While air travel may not be feasible for Peru, it might be possible to have a subsidized and contracted river transportation service to move people in the region more quickly and efficiently. Such approaches, namely where the government plays a critical role in regulating and supporting the development of local transport infrastructure, can be an important way in which transport-related problems in the Amazon region can be addressed. Full analysis of

²⁷ For example, in 2012, about 40 percent of subsidized kerosene in India was sold in the black-market (Sharma 2013).

²⁸ The ultimate objective of such schemes is to provide LPG and kerosene subsidies, pension payments, scholarships and employment guarantee payments as well as benefits under other government welfare programs directly to beneficiaries.

challenges, opportunities, and options available for addressing transport problems should be conducted by Peru.

6. FUEL PRICE STABILIZATION FUND

Like all economies, Peru is susceptible to developments on world petroleum and petroleum product markets. These developments can include sustained increases in price as in 2008 and short-term volatility. Historically, these changes when transmitted to the final consumer have been politically unacceptable. To slow down the transmission of international market prices to Peru's domestic prices, Peru created the Fuel Price Stabilization Fund (*Fondo para la Estabilización de Precios de los Combustibles Derivados del Petróleo* or FEPC) in September 2004.

HISTORY AND CONTEXT²⁹

The FEPC was established with five different pieces of legislation and,³⁰ the FEPC was made permanent at the beginning of 2013. Initially, all types of gasoline, diesel, industrial oil, kerosene, and liquefied petroleum gas (LPG) were regulated under the FEPC. Since 2004, the number of covered fuels has been reduced and the program now attempts to target the most vulnerable members of Peruvian society.

The FEPC utilizes a price band scheme to help maintain the price of fuels sold at the wholesale level in the economy at stable levels. The bands are set bimonthly by OSINERGMIN (Supervisory Body of Investment in Energy and Mining). The price bands are set at no more than 5 percent either up or down from the average import-parity benchmark, also referred to as a reference price, over the previous two months (with the exception of LPG, for which price adjustments are limited to 1.5 percent of the export parity price). In addition to the price bands, OSINERGMIN publishes the import-parity benchmark price, or reference price, for each type of fuel weekly.³¹ Weekly reference prices are based on the average price from the last days of trading prior to publication.³²

The price band of each type of fuel is used to determine the compensation paid by the FEPC or the contributions paid to the Fund.³³ Compensation or contributions for fuels, with the exception of LPG, under the FEPC are based on the concept of import parity price (IPP)³⁴;

²⁹ Unless noted otherwise, all materials in this section are based on a Memo on FEPC provided by MINEM to the APRP on May 20, 2014.

³⁰ The legal basis for the FEPC consists of: a) Urgency Decree No. 010-2004; b) Supreme Decree No. 142-2004-EF; d) Directional Resolution No. 052-2005-EM/DGH; e) Law No. 29952; and f) Amended and Complementary regulations.

³¹ See, for example: <http://www2.osinerg.gob.pe/PubPreciosReferencia/DocPublicaciones/2014/mayo/PrecioReferencia19052014.pdf>

³² See, for example, <http://www2.osinerg.gob.pe/PubPreciosReferencia/DocPublicaciones/2014/mayo/PrecioReferencia19052014.pdf>. Reference prices are based on the average price from the last days of trading before publication: <http://www2.osinerg.gob.pe/PreciosReferencia/TarPreciosReferencia.html>.

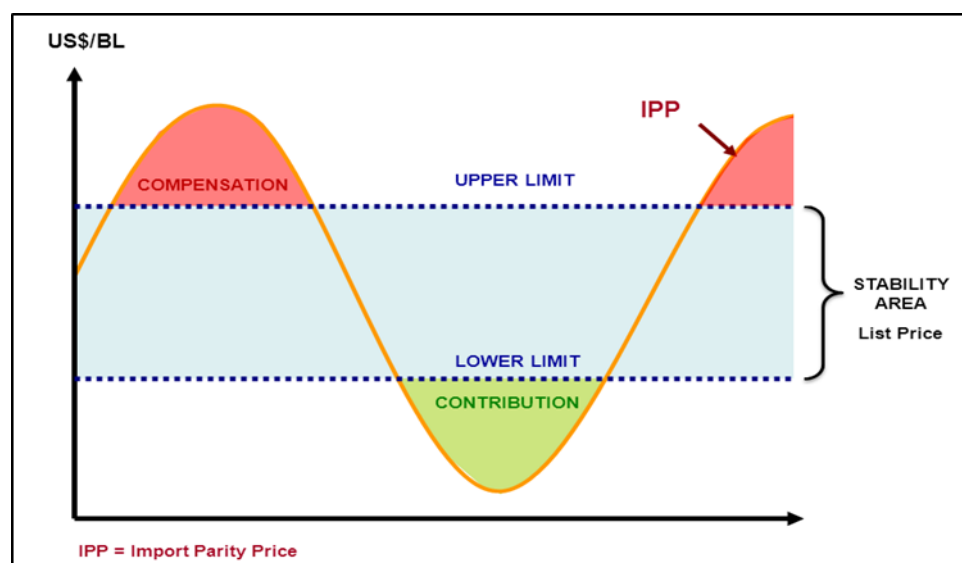
³³ See <http://www2.osinerg.gob.pe/>.

³⁴ The IPP is determined based on reported prices for West Texas Intermediate (WTI) and calculated by adding all of the costs (e.g., refining if applicable, transportation, relevant duties and taxes) of importing the fuel into Peru from the Gulf Coast of the United States.

those values for LPG are determined by the export parity price (EPP).³⁵ When the IPP is higher than the price band's upper limit, a contingent credit (a compensation factor) is issued to refiners and importers by the Peruvian Treasury. If the IPP is below the lower limit, a contingent liability (a contribution) is assessed by the Peruvian Treasury against hydrocarbon producers and importers. Figure 6-1 illustrates this mechanism.

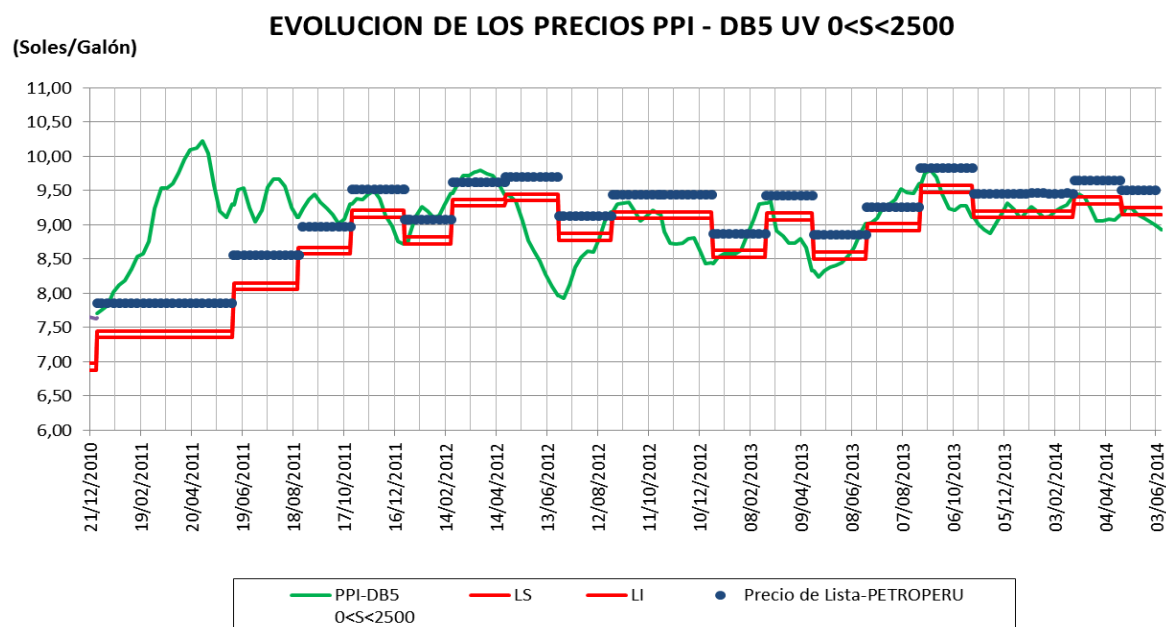
However, refiners such as PetroPeru are not obliged to offer wholesale prices in the market within those bands. As shown in Figure 6-2, wholesale prices have tended to be set at levels above the band (but below import-parity levels). This shows that while stabilization fund does have a dampening effect on wholesale prices, the costs of maintaining the fund are not fully reflected in prices paid by consumers.

Figure 6-1. Compensation and Contribution Mechanisms for FEPC



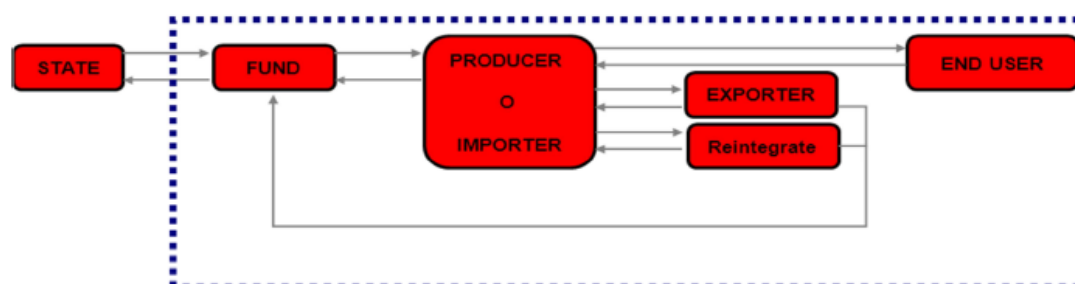
Source: MINEM document on FEPC provided to the APRP

³⁵ The EPP is determined as the FOB (free on board) price of exports in Pisco, Peru.

Figure 6-2. Comparison of List Prices with Price Band for Low-Sulfur Diesel

Source: Presentation from OSINERGMIN, provided to APRP

In order to provide contingent credits, the FEPC receives funding from several sources. When the band is set below the import parity reference price, Peru contributes to the fund by means of a supplementary credit, which is approved by Peruvian statutes. When the band is above the import-parity reference price, the FEPC receives contributions and/or receives returns from hydrocarbon producers, importers, exporters, and reintegrate³⁶. These funding resources thus cover any debt owed to the producers and importers. Figure 6-3 illustrates the flows of funds between the participants in the funding mechanism.

Figure 6-3. Flow of Funds between Participants in the FEPC

Source: MINEM document on FEPC provided to the APRP

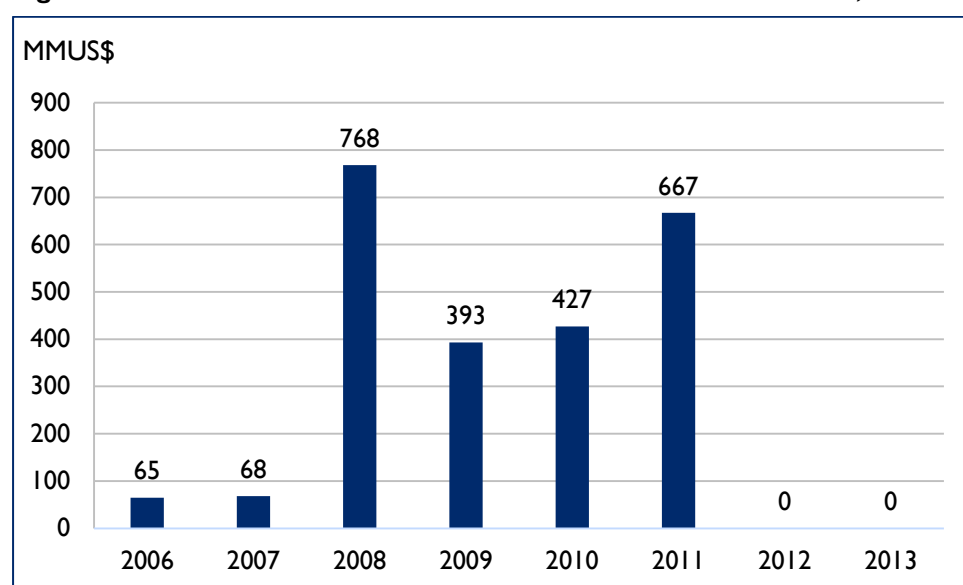
Prices paid to producers and importers by end-users, exporters and distributors are freely set by the market but tend to be influenced by the price bands specified by the OSINERGMIN. Contributions (or a contingent credits) flow into the FEPC from producers, importers, exporters, and distributors during periods when import parity benchmark prices are below the lower limit of the price bands. Compensation (or a contingent liability) flows from the FEPC to refiners and importers during periods when import parity benchmark prices are above the upper limit of the price bands. This flow of funds to firms occurs even

³⁶ The natural or juridical person in the supply chain of liquid fuels that produces or acquires differentiated products according to your destination and marketed to a different destination.

list prices are set above the upper band, but are lower than prices on the international market.

Historically, the FEPC has had a significant impact on Peru's fiscal condition. Figure 6-4 illustrates a history of the transfer of public resources used to support the fund. In order to cover contingent liabilities from the fund during the period 2006 to 2011, Peru had to assume slightly under US\$2.4 Billion in debt. The pattern of transfers parallels international market prices for West Texas Intermediate (WTI) crude, which increased from US\$72 a barrel in 2007 to US\$140 a barrel in July 2008; declined to between roughly US\$40 a barrel and US\$80 a barrel in 2009 and 2010, and then increased to levels exceeding US\$110 a barrel in 2011.

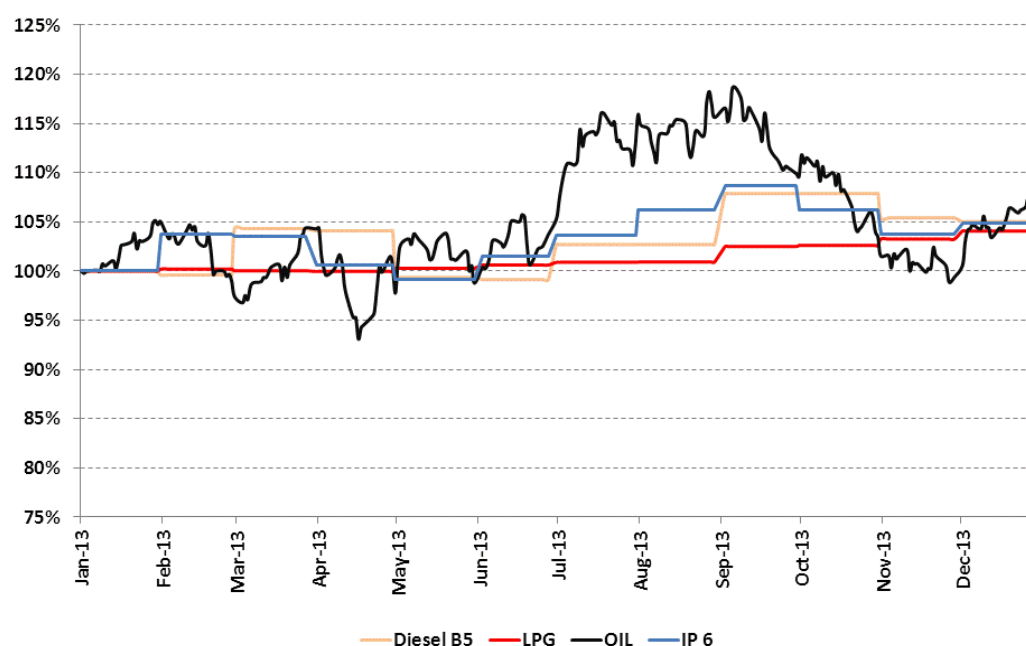
Figure 6-4. Evolution of Government of Peru Transfers to the FEPC, 2006 to 2013



Source: MINEM document on FEPC provided to the APRP

With international market prices stabilizing within a relatively narrow band since 2011 and with a series of reforms to the FEPC, the FEPC did not require transfers of public resources during 2012 and 2013. As international benchmark prices remain relatively stable, the FEPC manages to be self-sustainable. Nevertheless, Peru is aware that any sudden increase in international benchmark prices would require Peru to contribute funds into the FEPC. With reform and restructuring of the price band mechanism (i.e., moving to a smoothing mechanism over time) resulting in longer periods of contributions, the FEPC's debt has decreased since 2011 to approximately US\$80 million (as of December 31, 2013).

Figure 6-5 illustrates the effect of the FEPC on dampening fluctuations of domestic fuel prices in comparison to fluctuations in the international market price for oil products. In 2013, domestic prices for petroleum products only changed by 3 percent compared to the base index, compared to international benchmark prices which ranged from 0.9 to 1.2 from the base index. This has also meant that consumers have experienced lower price levels for oil products than what would otherwise have been the case. All other things being equal, this will have resulted in higher demand.

Figure 6-5. Changes in Indexed World Crude Prices and FEPC Fuel Prices in 2013

Source: MINEM document on FEPC provided to the APRP.

The FEPC has undergone reform since 2004. Initially, all fuels were covered including LPG, gasoline, kerosene, diesel, industrial oil, and others. Price bands for these fuels were fixed initially. With increasing prices in 2008, the Peruvian Treasury experienced difficulties in paying the required funds to the FEPC. Accumulated substantial contingent liabilities to refineries (which were paid when funds were available) created acute liquidity problems for refiners and jeopardized their continued operation (IMF 2013b).

Further, in mid-2008, Peru released a report studying the distributional impacts of the FEPC. The study showed that the wealthiest 20 percent of the population was receiving a subsidy amount that was eight times greater than the amount received by the poorest 20 percent of the population. Using this study result, in April 2010, when international petroleum prices had declined, the government introduced the current mechanism of automatic updates to the price bands every two months. In addition, a special subaccount to finance the FEPC was created in the Peruvian Treasury; this reduced the uncertainty of payment to refineries. Another measure for improving the operation of the Fund was the establishment of a differential treatment to economic sectors involved in exploration and exploitation of oil and mineral resources, aquatic resources processing, and cement manufacturing. In this sense, in April 2010, the Government established the reduction of compensation and contribution to only 10%. Later, in October 2011, fuel used by those previously selected sectors was excluded from the FEPC. These measures represented a significant savings of fiscal resources.

In October 2011, all the different types of high-octane gasoline (a luxury fuel) were removed from the FEPC, with domestic prices subject to the full impacts of changes in international markets; and, in August 2012, regular gasoline was also removed from the FEPC. This left the current set of petroleum products (LPG for domestic purposes or packaged in 10 kg cylinders, diesel for vehicle use, and diesel and residual petroleum fuels used by isolated electricity generation systems) which are the most politically sensitive (used

primarily by lower-income segments) and constitute approximately 80 percent of the subsidy spending in Peru. The fiscal impacts were also reduced with these reforms.

FINDINGS ON FEPC

The FEPC has likely caused higher fossil fuel consumption than would otherwise be the case. Given the sustained period of oil price (and liquid fuel price) increases since the FEPC was introduced in 2004, domestic prices have tended to be lower than international benchmarks. All other things being equal, this will have resulted in higher oil consumption than would have been the case without the FEPC. While domestic prices are set freely, the FEPC has had a demonstrable impact on pricing behavior. It has muted the full impact of international oil price increases on to the consumer.

The FEPC has resulted in significant fiscal costs to Peru; these costs have been now mitigated to an extent based on a series of recent reforms. The FEPC resulted in significant fiscal strain to Peru after a sustained period of oil price rises (see Figure 6-4 and the associated discussion). The exposure of Peru to future oil price rises has been mitigated with the removal of a number of oil products. Now the FEPC only applies to diesel for transport use, packaged LPG, and residual petroleum fuels used by isolated electricity generation systems.

The FEPC has likely undermined the competitiveness of Peru's refineries. Peru's two refineries and its sole importer have been exposed to the risk of nonpayment by Peru. During the sustained period of oil price rises when the government accumulated a substantial debt, the government simply paid the refiners when it had funds available. This created acute liquidity problems for the refiners, delayed much-needed investment in conversion and desulfurization capacity and jeopardized their ongoing operation. The situation has now improved, but there is no specified timeframe for the payment of FEPC contributions to the refiners and importer. This continues to pose an element of ongoing uncertainty for the refineries.

The potential benefits of FEPC are poorly targeted. Initially, the scheme covered all fuels and there were no mechanisms used to direct the scheme only to the most marginal sections of the population. Subsequent refinements to the FEPC are an improvement but the scheme continues to apply to all transport diesel and packaged LPG. There is no mechanism to target the benefits to only low-income users of transport diesel and packaged LPG that are in most need of it.

FEPC has only marginally reduced inflationary pressures. The muted domestic price response to international oil price movements will have resulted in lower inflation levels than would have otherwise been the case. Based on modeling work undertaken by the Ministry of Economy and Finance, a 10 percent increase in world oil prices without the FEPC would result in a 1.07 percent increase in inflation and a 0.3 percent drop in GDP. With the FEPC, a 10 percent increase in oil prices would only reduce inflation by 0.4 percentage points; i.e., a 10 percent increase in oil prices would result in 0.67 percent inflation in the economy with the FEPC, and without the FEPC, the inflation would increase by 1.07 percent. The overall GDP impact of the FEPC from 2004–2011 (the period over which the modeling was undertaken) would have been to reduce the impact of a 10 percent rise in oil prices to a 0.19 percent drop in GDP rather than a 0.3 percent GDP drop that would have otherwise been the case.

The direct costs of the FEPC between 2004–2011 to Peru are likely to far outweigh the marginal benefits the scheme may have provided in mitigating inflation rises and the impact on GDP. With subsequent changes made to the FEPC (such that only diesel for transport, diesel, and residual petroleum fuels used by isolated electricity generation systems, and packaged LPG remain), it is unlikely that there would be any significant impact on inflation should the FEPC be ended completely.

Incremental reforms to the FEPC have been positive. A series of reforms have helped to depoliticize fuel pricing and significantly reduced the fiscal exposure of Peru to future increases in fuel prices:

- Removal of gasoline, bulk LPG, kerosene, aviation fuel, and fuel oil. This action has significantly reduced the fiscal exposure of Peru.
- Automatic adjustment of the pricing bands once every two months and a smoothing mechanism. Prior to these rule changes, changes to the pricing bands were subject to political pressure, with the pricing band lagging behind increases in international benchmark fuel prices for significant periods. This exacerbated the fiscal cost to Peru.

END GOAL/VISION

The APRP believes, in line with Peru's view, that the ultimate goal should be to depoliticize fuel pricing completely and eventually close down the FEPC. Fuel pricing is beyond the control of any single government and by seeking to insulate the population from international price movements, Peru is simply exposing itself to significant fiscal risk. The removal of FEPC should be phased in and be accompanied by appropriate offsetting measures targeted to vulnerable segments of the population.

Recommendations on FEPC

The following APRP recommendations are consistent with other Peruvian policies (energy, economic and social). Ultimately, because the FEPC is not effective in achieving its goals and is redundant to a certain extent with other programs, the FEPC should be eliminated. Where it is appropriate, fuels such as LPG and diesel for public transport could be shifted to social programs that provide discount vouchers to vulnerable segments of the population. This will help target benefits more effectively.

Recommendation 5: Move packaged LPG out of the FEPC and focus efforts on expanding the FISE. Two separate Government measures target packaged LPG users. The FEPC attempts to insulate users from fluctuations in LPG prices but is indiscriminate as to who benefits. The second, FISE, focuses *only* on those in poverty. Both schemes are overseen by the same government agency. It would make sense for the government agency responsible for managing both schemes (OSINERGMIN) to focus on a single scheme. The FISE is explicitly targeted to those in need and could be both expanded (e.g., to those not connected to the electricity grid) and refined (e.g., to account for slightly higher LPG use by poor people in the Amazon or to provide a higher subsidy after a price rise by implementing a price with a cost-of-living adjustment).

Recommendation 6: Move diesel for public transport into the FISE. Diesel is primarily used for public transport and the distribution of goods. In the case of the distribution of goods, diesel use directly and indirectly affects all sectors of the population and there is no way of differentiating between those who really need support and those who

do not. That is not the case for diesel used in public transport, which is primarily used by lower income sections of the population. This may be an argument for moving diesel used in public transport into the FISE (e.g., discount vouchers, which are processed electronically, for lower-income segments). Such a targeted social program would also support other Government of Peru policy goals such as the formalization of public transport, and the expansion of the use of natural gas for transportation.

Recommendation 7: Gradually reduce the time between bandwidth adjustments as a potential precursor to total removal of other transport diesel from the FEPC. For diesel used for transport, other than for public transport, a gradual reduction in timing of the bandwidth adjustments could act as a precursor to the total removal of all fuels from the FEPC. By way of example, this could be done in one week intervals over a six month period. The current period of relatively stable international oil prices and strong economic growth seems to be a good time to introduce such a measure.

Recommendation 8: Use other macroeconomic tools to control inflation. Oil prices are outside the control of any single government. When oil prices rise, each economy is affected. Inflationary pressures typically are dealt with through changes in interest rates by the Central Bank. This is a more appropriate and direct way than using the FEPC to respond to inflationary pressures.

Recommendation 9: Consider increases in excise rates on fuel to reduce the volatility of oil price increases felt by consumers. When excise rates on oil products are relatively low (2.8 percent in the case of low-sulfur diesel and 4.6 percent for packaged LPG), as they are in Peru, any change in international fuel price benchmarks will be felt by end-users much more than in economies where the excise rate comprises a relatively high proportion of the end-consumer cost. Peru currently plans to increase excise rates on “dirty fuels.” As well as the obvious environmental and health benefits that such a measure would provide, it would also have the additional benefit of reducing the impact of changes in international benchmark prices for consumers of these products.

Recommendation 10: Increase use of natural gas in the transport fleet to reduce costs and volatility to end-users. The APRP team notes plans by Peru to encourage more extensive use of natural gas in the transport fleet. As well as the security of supply and environmental benefits of this measure, it would also reduce costs and fuel price volatility to consumers.

Lessons Learned and Best Practices

In this section, some of the lessons learned from the case studies of how other economies have addressed petroleum prices are listed. Peru can use these examples and adapt them, in order to phase out the FEPC.

World Bank Case Studies on Petroleum Product Pricing

In 2013, the World Bank released a report on experiences of 65 developing economies on petroleum pricing and related policies (Kojima 2013). The report argues that while artificially low domestic prices do reduce inflation in the short term, they have serious undesirable consequences: “flourishing black markets, smuggling, fuel adulteration, illegal diversion of subsidy funds, large financial losses suffered by fuel suppliers, deteriorating refining and other infrastructure, and acute fuel shortages causing economy-wide damage” (Kojima 2013, p.2).

Table 6-1 (adapted from Table 4 in Kojima 2013) shows the various price-adjustment mechanisms and their advantages and potential problems. This table provides a useful summary of the challenges Peru will face if it attempts to control prices rather than allowing them to be freely set by the market.

Subsidies, price controls, and other restrictions can also prolong inefficiencies in domestic refineries and oil marketers. This is particularly the case for economies with monopolies. For example, refineries in the Islamic Republic of Iran, Nigeria, Iraq, and Mexico are harmed by their monopoly status. These economies are major net oil exporters, yet they import petroleum products at world prices and have to sell below costs of supply (Kojima 2013). This can result in a lack of capital for refinery improvement and expansion. It allows for inefficient, high-cost refineries to continue operating, and it can prevent the upgrade of fuel quality standards.

As noted above, Kojima (2013) views that direct and targeted cash transfers are a much better way of supporting specific sectors and population groups, rather than more regressive approaches such as a stabilization fund.

Table 6-1. Types of Different Price Adjustment Mechanisms

Mechanism	Advantages	Potential Problems
Steadily increase price at regular time intervals until cost-recovery levels are reached: <ul style="list-style-type: none"> • By a predetermined monetary amount (Thailand for LPG for vehicles and industry) • By percentage (Mexico) 	Each price increase is small and predictable	Could lose political commitment over time, and invite resentment if world prices are falling. If the increases are regular but small compared to world price increases, subsidies could continue for years (as in Mexico)
Deregulate prices for higher-grade fuels (Egypt, Indonesia, Malaysia)	End subsidies to the rich, who are the main consumers of higher-grade fuels	Fuel switching by users from higher-grade to cheaper fuel, adulteration of higher-grade fuels with subsidized fuels
Ration heavily subsidized fuels, charge higher prices outside quota (kerosene and LPG in India, gasoline and diesel in Iran)	Limit subsidies	Diversion of rationed fuels to black markets or smuggling
Set different prices depending on user category (Costa Rica, India, Indonesia, Iran, Malaysia, Nepal, Thailand)	Limit subsidies	Selling the same product at different prices invites corruption, starting with diversion to consumers who are not entitled to the subsidized fuel (essentially every economy)
Shift subsidy from one product to another (kerosene-to-LPG conversion in Indonesia)	Subsidy for one product is completely eliminated	Could lead to a growing subsidy on the product to which the subsidy is shifted (as in Indonesia)
Introduce a temporary stabilization fund (Chile, Peru), temporary tax reduction (diesel in Thailand)	Deal with large price shocks while limiting the period of artificially low prices	Political pressure to repeatedly extend the phaseout date (Chile, Peru, Thailand), resulting in a growing budgetary outlay
Switch to rule-based pricing when world prices are low (China in Jan 2009)	No large price increases needed at time of switching	When world prices begin to rise, the political will to adhere to rule-based pricing may weaken (as in China); a period of very low prices may not return in the future for governments to follow this approach
Adjust when world prices change significantly and subsidies become too costly to bear (Bolivia, Islamic Republic of Iran, Jordan, gasoline in Nigeria)	Stable prices between changes	Price changes are large when adjustments are finally made, adjustments almost always mean price increases, tendency to delay price increases, lack of predictability, possibility of growing subsidies,

Mechanism	Advantages	Potential Problems
		politicization of price increases, hoarding in response to rumors of imminent price increases and leading to fuel shortages
Adjust when world prices change more than $\pm X\%$ (Malawi, Togo)	Stability within the price band	If X is relatively large, potentially large changes when adjustments are made; possibility of losses exceeding savings within the price band
Float prices within a price band, smooth changes outside (Chile for small and medium consumers, Peru)	Avoid large price changes	Can lead to large subsidies unless price bands are frequently adjusted
Set different rules depending on world oil price (China)	Limit subsidies to times of high world prices	Unless price bands are adjusted from time to time, if world prices remain high, subsidies could grow
Agree on the total subsidy envelope for the fiscal year and adjust prices, volume, or both accordingly	Limit the total subsidy bill.	Politically difficult to raise prices when money runs out (Indonesia)
Adjust based on world prices averaged over past 3–6 months (no example in this study)	Prices change gradually	World and domestic prices could be moving in opposite direction, inviting political backlash; could lead to large losses if world prices are rising over time.
Adjust regularly based on world prices averaged over 1–4 weeks (Dominican Republic, South Africa)	Tracking world prices well	World price volatility quickly transmitted
Deregulate, subject to anti-trust regulations (Philippines, Turkey)	Market based, no subsidies	Downstream petroleum sector needs to be competitive or else consumers may be charged high prices; world price volatility immediately transmitted

Source: Kojima, 2013

ERIA assessment of removal for fossil fuel subsidies

A 2011 Economic Research Institute for ASEAN and East Asia (ERIA) report on the impact of pricing reform in ASEAN and six other major economies in Asia (East Asian Summit, EAS) is relevant to Peru (Kojima and Bhattacharya 2011, 191–212). The report discusses how energy price reforms and the deregulation of the domestic energy market are necessary to help the EAS region develop a sustainable, efficient, and integrated energy market. In the EAS region, developing economies have more price supports than developed economies, with the support primarily for diesel. This situation resembles that of Peru.

The study relies on the Regional Environmental Policy Assessment (REPA) model to assess the possible impacts of energy pricing reform in this region. Using the model, the impact of complete subsidy removal was simulated, with an analysis on how that impacts GDP, social welfare, and CO2 emissions (Kojima and Bhattacharya 2011).

The study analysis and simulations found that an economy's total economic growth is strongly linked with the regulation and control of energy commodity pricing. Controls on the price of energy often restrict price pass-through to the consumers. Kojima and Bhattacharya (2011) also show that although these subsidies aim to protect the poorest consumer groups that are most strongly affected by fluctuating international oil prices, the subsidies lead to significant market distortions, are corruptible, and provide incentives for misuse of cheaper energy sources. Hence, the Kojima and Bhattacharya (2011) study substantiates the APRP recommendations on the removal of the FEPC.

The ERIA study also found that removing energy subsidies led to improvements in the economy and the environment. The removal of energy subsidies can boost productivity and help reduce market distortions, increasing economic output. Furthermore, the smallest removal or reform to energy price regulation can have positive results.

Brazilian Experience of Stabilization Fund

In 2013, the IMF reviewed and analyzed the oil stabilization fund in Brazil, which is similar to the one in Peru (IMF 2013b). Brazil's oil stabilization fund was passed in 1980 in order to reduce the volatility of crude oil prices. The government of Brazil set the price of the oil sold to Petrobras's refineries. When international crude oil prices were high, the stabilization fund accrued contingent liabilities to Petrobras, but when crude prices were low, these liabilities were expected to be offset. However, over the course of time, the stabilization fund accrued huge deficits. In the mid-1990s, the Brazilian government transferred 0.8 percent of the 1995 GDP (5.8 billion reais) to Petrobras to cover for this large accumulation of debt. "Petrobras had to absorb other losses that were never transparently recorded on the budget" (IMF 2013b).

To address this problem, over the course of a decade (the 1990s), the Brazilian government used a gradual approach for the removal of subsidies to deal with opposition from interest groups (IMF 2013b, pg. 8):

- Brazil's government informed consumers that energy prices and services would be improved and more affordable with privatization and liberalization of energy costs.
- The government gradually removed subsidies on energy products, focusing first on those products that were used by politically weak stakeholders (asphalt, lubricants, and gasoline for airplanes). Subsidies that were used by politically strong stakeholders (liquid fuels used in transportation and industry) were removed later.
- Short-term inflation resulted from energy price liberalizations, but these increases were short-lived.
- "To avoid the emergence of subsidies, frequent price increases were necessary in an environment of high inflation. However, diesel price increases did not keep pace with exchange rate depreciation in the late 1990s, leading to an upward spike in diesel subsidies to about 1 percent of GDP in 1999."
- In 2002, all fuel prices, including diesel, were liberalized.

Since 2002, domestic prices increased and there is no official setting of prices for fuels. This has helped avoid recurrence of subsidies. The Brazilian National Petroleum Agency monitors the fuel prices through a survey mechanism.

Some of the key lessons from the Brazilian experience are (IMF 2013b, pg. 11):

- Removing subsidies gradually may result in less resistance from groups that benefited from the subsidies. It is important to assess political implications and stakeholder strengths.
- "Liberalization reforms have more chance to succeed with a popular government." President Cardoso capitalized on political support (resulting from controlling hyperinflation) to undertake his liberalization agenda.
- The use of stabilization funds and adjusting oil prices is not practical and can lead to negative consequences under unstable macroeconomic conditions.
- Liberalization of prices allows for subsidy reform to remain durable, as prices are automatically adjusted to market fluctuations.

- “Targeted social programs can reduce opposition to subsidy reform.” For example, Brazil compensated low-income households with a voucher to help offset the increase in LPG prices.

Chilean Experience on Stabilization Fund

Chile had two fuel stabilization funds whose aims were to reduce the price volatility of imported fossil fuels, similar to the FEPC in Peru. From 1991 to 2005, it had a stabilization fund for oil, and then from 2005 to 2010, it had a similar fund for LPG, LNG, gasoline, diesel, and kerosene (World Bank 2012). “The funds maintained the price of fuel imports within a price band to match recent average import price levels. The import parity price was calculated each week and compared with the band limits. This determined whether a credit or a tax would be applied to end-user prices to keep the price within the [...] band.” (World Bank 2012). The total fiscal cost of Chile’s FEPC from 2006 to 2009 was 0.65 percent of its 2012 GDP (IMF 2013b, pg. 14).

In 2010, Chile removed the stabilization fund and incorporated a scheme called SIPCO,³⁷ with two elements for reducing variations in fuel pricing: a) the first is the variation of the fuel excise tax rate in response to changes in international oil price (this variation effectively put in a band of 10 percent of variation); and b) an insurance compensation mechanism that would be triggered if the spot price exceeded the reference price. The compensation and the insurance premiums are accounted for in the variable component of the fuel tax (World Bank 2012 and IMF 2013b). Large industries (power generations and mining companies) are not affected by the changes in the excise taxes, as they recover the taxes through deductions (IMF 2013b, pg. 14).

Similarly, Peru could consider the variation of the fuel tax and consider the creation of an insurance scheme to protect consumers from very high price volatility.

Some of the lessons learned from Chile include (IMF 2013b, pg. 15):

- Fiscal cost of stabilization funds depend on their design, and therefore studies with sensitivity analyses need to be conducted to assess potential impacts on the economy.
- It is possible to allow the smoothing mechanism to target specific consumers. Chile’s approach of adjusting fuel taxes allows the impact to be more felt by smaller consumers than large consumers (as these large consumers deduct the taxes).
- Fuel stabilization funds should be temporary. Chile has generally used its smoothing mechanisms during periods of very high international prices (Gulf War and Hurricane Katrina).

³⁷ SIPCO (Sistema de proteccion ante variaciones de precios de combustibles).

7. ENERGY FUND FOR SOCIAL INCLUSION (FISE)

The *Fondo de Inclusión Social Energético* (FISE)³⁸ was begun in 2012 in response to a finding of the 2007 census that 37 percent of the population used traditional fuels and that 60 percent of this number lived in rural areas. The law promotes use of liquefied petroleum gas for residential and transportation purposes in vulnerable³⁹ or low-income segments of the population. The FISE also increases access to electricity in areas that are isolated from the SEIN by providing compensation for the development of New Renewable Energy (NRE). Technologies designated for support include photovoltaic cells, solar panels, biogas digesters, and similar renewable technologies. Finally, the FISE provides advocacy for access and compensation for LPG to lower income, rural and urban households.⁴⁰ Compensation for LPG is delivered monthly through a voucher system to households that have been identified as vulnerable. The APRP review focused primarily on the LPG subsidies for the vulnerable households.

HISTORY AND CONTEXT

Universal access to electricity is one of the crucial pillars for poverty reduction in an economy. According to the INEI, the statistics agency, Peru currently has an estimated 7.3 million people lacking access to modern and clean domestic fuels. These vulnerable populations depend mostly on traditional and high-polluting sources of energy, such as dung and firewood. According to OSINERGMIN (2014), the National Household Survey in Peru showed that 43.5 percent of households in 2012 classified as poor used firewood to cook, and 19 percent of households used dung, kerosene or coal (see Figure 7-1). In contrast, 66 percent of the households classified as extremely poor used firewood as fuel for cooking their food, and 22.7 percent used dung, kerosene or coal.

The use of traditional fuels by poor populations has adverse health and environmental impacts, while also requiring the poor to forage for energy, reducing time spent on education, employed work, and other productive activities. Shifting from traditional to commercial fuels enhances a household's welfare, life quality, and labor productivity. Replacing traditional fuels with LPG for cooking produces substantial reductions in indoor pollution, which results in better health, increased quality of life, and ultimately an increase in life expectancy. Reductions in the use of traditional fuels also increase forestation and reduces other emissions such as green-house gases, and black carbon and other particulates.

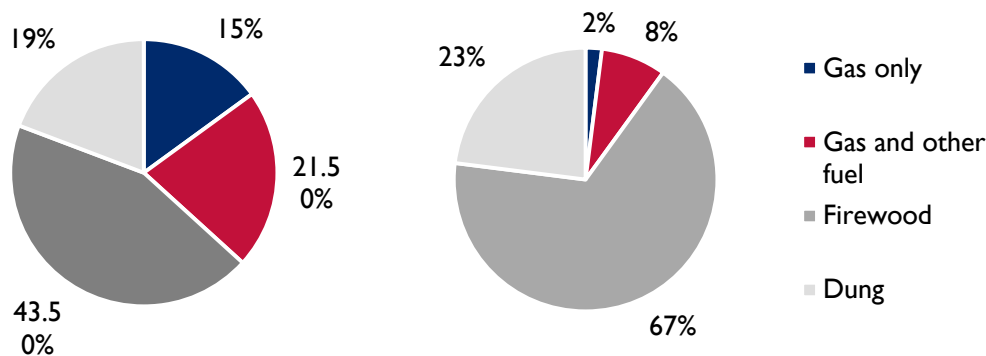
³⁸ The FISE was created in September 2013 under Law No. 2982, which amended Law No. 29969 passed in June 2012.

³⁹ Vulnerable population refers to a set of features that generate weakness, disadvantage or problems for the performance and the social mobility of the actors (be they persons, households or communities) and that act as brakes or obstacles for the adaptation of the actors to changing social scenarios (FISE 2014).

⁴⁰ See <http://www.fise.gob.pe/>.

The challenges of universal energy access in Peru are complicated by the fact that Peru's poorest populations are scattered and living in low-density population areas, and the poor have low purchasing power and small per capita consumption (OSINERGMIN 2014). Furthermore, the lack of infrastructure, in particular road infrastructure, has made rural areas unattractive to private investors, who consider investment in universal energy access projects as unprofitable and unfeasible in these isolated areas.

Figure 7-1. Fuels Used for Cooking in Poor (left) and Extremely Poor (right) Households



Source: OSINERGMIN, 2014, *Social Inclusion Energetic Fund*.

In order to reduce this energy poverty and to provide modern fuels to the poor, Peru passed Law No. 29852 in April 2012, creating the FISE. The FISE aims to provide for social compensation and universal energy availability to the vulnerable populations. In June of that year, the government passed Supreme Decree No. 021-2012-EM, which approved the regulations of FISE and established the provisions for developing criteria to target FISE beneficiaries.

Under the FISE program, a household that is identified as being below the poverty line or in fuel poverty (i.e., lacking access to commercial sources of energy) can receive assistance in obtaining LPG for domestic purposes. Participating households are identified on the basis of several different criteria:

- Their average monthly electricity consumption needs to be less than or equal to 30 kilowatt hours (kWh);
- Have a kitchen with LPG stove, and MINEM will provide them one if they do not have it;
- Household income needs to be less than \$6400 per year;
- Must be registered in The National Registry of Identification and Civil Status – NRIC;⁴¹
- The house must have precarious construction features; and
- Only one beneficiary per family is allowed.

⁴¹ Only households in the lowest five categories of the Household Targeting System (SISFOH) qualify for the LPG program. The SISFOH has four objectives: 1) improving equity in social spending; 2) establishing technical standards for identification of households to be targeted; 3) identifying potential users of social programs; and, 4) quantifying a household's welfare with the Household Targeting Index (IFH). The IFH uses data on housing characteristics, household characteristics and characteristics of household members; in the index calculation, these data combine information on income and spending on base services. The lowest valued indexes identify families with a lower quality of life (<http://www.sisfoh.gob.pe/>).

Recipients of the FISE program receive a voucher that provides a monthly discount of 16 soles (approximately US\$5.70) on the first refill of a 10 kilogram LPG container each month. This discount is fixed by law and cannot be changed without an act of the Peruvian Congress; there is no provision for inflation or increases of LPG prices on the international market. As noted above, if a beneficiary does not already have a LPG stove, a two-burner stove, a 10 kg container, and a valve are provided.

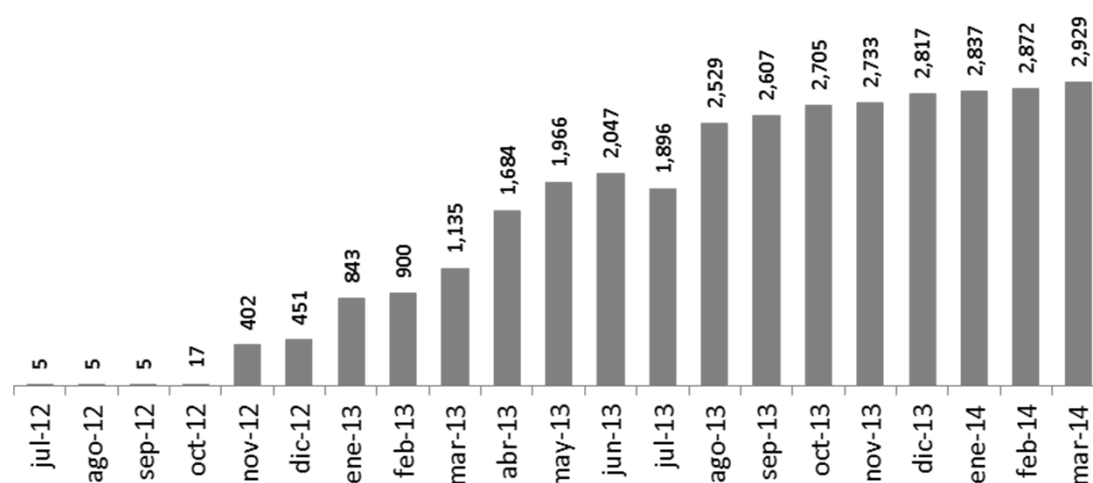
The resources for the FISE are provided by surcharges⁴² on other customers in the energy sector. Surcharges, which are equivalent to about 2.5 percent of monthly electricity billing, are assessed on the monthly bills of unregulated electricity customers (e.g., large industrial facilities). Also, surcharges equivalent to approximately US\$1.00 per barrel are assessed by primary producers and importers on sales of liquid hydrocarbon products and natural gas liquids to final consumers. Further, natural gas customers pay US\$0.055 per million cubic feet (Mcf) as part of a user's charge for natural gas transmission services. Electricity generators are allowed to pass the charges they incur to both regulated and unregulated customers of the SEIN; recovery of this surcharge component is regulated by OSINERGMIN under its transmission and distribution ratemaking authority. As the scheme is still relatively new, no review has been undertaken as to the full economic costs of this cross-subsidy.

OSINERGMIN also has the authority until April 2017 to administer other activities under the FISE, including: 1) approving the transfer program used to improve access to LPG by low-income households; 2) promoting an expanded use of natural gas in the residential and transportation sectors; 3) administering projects (e.g., New Renewable Energy) to increase access to electricity in frontier areas where the grids are isolated or do not exist; and, 4) other administrative functions required for the FISE. OSINERGMIN coordinates the programs designed to reach vulnerable populations with MIDIS (Ministry of Development and Social Inclusion).

The LPG program costs roughly 230.4 million soles (about US\$82.3 million) but is completely supported by the surcharges paid by other energy consumers. Households that are identified and registered as beneficiaries are sent a discount voucher, which appears as a numeric code on their monthly electricity bill. Households can then redeem the discount voucher code by cell phone. The beneficiaries will have two months to validate the discount voucher to buy LPG. The transaction must be performed with an authorized LPG agent who signs an agreement with the local distribution company and accepts the voucher as payment. Where electricity is not available to a household, other means of distribution need to be utilized, including a network of authorized agents who can implement the program. However, this expansion has not yet occurred.

During the initial program implementation, the network of authorized agents was found to be insufficient. Therefore, during the first year of the program, efforts were made to expand the network to meet the needs of some of the most vulnerable in the population, as seen in Figure 7-2. The rapid expansion and success of the FISE program can be attributed to the expanded network of authorized agents for the redemption of voucher codes.

⁴² Government of Peru justifies this cross-subsidy as follows: "the primary motivation of a policy of subsidies should be equity, since if they do not give these grants, the poor households do not have the ability to access energy resources" (FISE 2014). The rationale for this policy is based on the UN's "Universal Access to Energy" by 2030.

Figure 7-2. Evolution of Authorized LPG Agents under the FISE Program

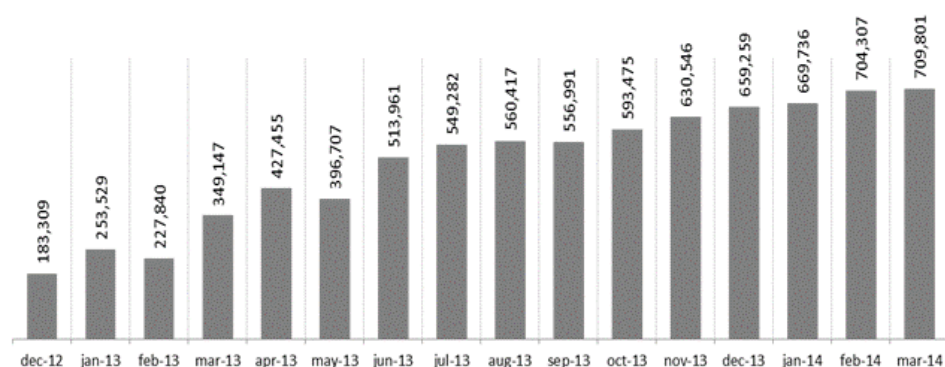
Source: OSINERGMIN, 2014

FISE has allowed for increased penetration of LPG and the shift away from traditional fuels without fiscal burden for Peru. Participation in the FISE program is, however, of limited duration as the social compensation is a temporary benefit. Once a participating household has access to a supply of natural gas or once a household's economic position has improved, the household will no longer be eligible for the program.

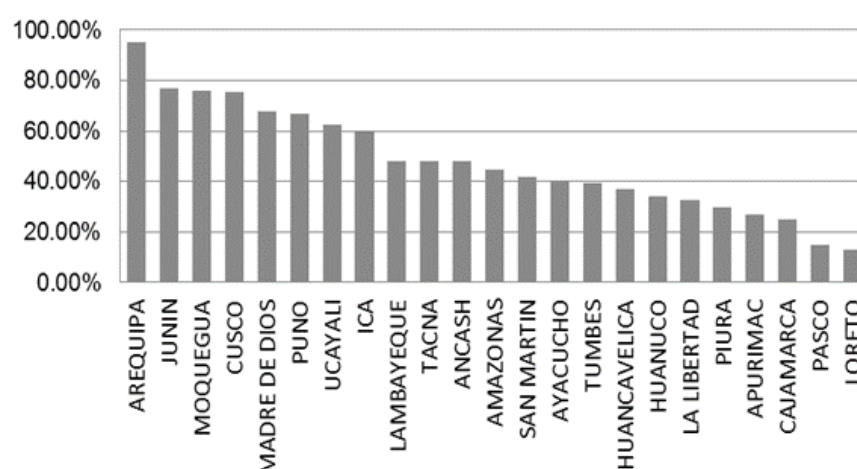
Since the program's inception in late 2012, more than 3.5 million Peruvians (as of April 2014) have benefited from the LPG distribution program. The program is highly successful in reaching the targeted beneficiaries because of its ability to reach a large percentage of vulnerable households as the illustration shows. From the initial rollout of the program in July 2012 to March 2014, the number of vulnerable beneficiaries has grown from about 24,000 to almost 710,000 households, as shown by Figure 7-3.

Not all of the FISE participants are classified as being below the poverty line because the FISE participants are selected based on electricity consumption. Figure 7-4 shows the percentage of FISE participants in various regions who are under the poverty line.

One reason for the high participation was that Peru incorporated a strong communications program, including a website, instant text messaging, and a number of communication devices to allow fast communication to the program to the recipients. In addition, the use of a digital voucher emerged as a solution to the issue in which processing and settlement delayed recipients from receiving fuel for several days. By using cellular banking, the program eliminated manual procedures, allowing the redemption or liquidation of vouchers to be done in real time. Additionally, digital vouchers reduced administrative costs, meaning more financial resources are available so that more households can benefit from the subsidy.

Figure 7-3. FISE Beneficiaries for all of Peru

Source: OSINERGMIN, 2014

Figure 7-4. FISE Beneficiaries Living in Poverty, by Region

Source: OSINERGMIN, 2014

The success of FISE was dependent on the lessons learned from the pilot program in the province of La Convención, in the Cuzco region. The pilot program began in July 2012 and only a few months later, OSINERGMIN was able to identify the strengths and weaknesses of the program, and make necessary adjustments in order to implement the program nationwide in November 2012.

Two members of the APRP interviewed beneficiaries of the program that were located in the city of Ventanilla, residing in Pacha Cuteck, which is approximately two hours outside of Lima. The peer review team found that the continuation of the FISE program as essential considering the demographic and geographical location of Peru's vulnerable populations. The APRP members found that the provision of clean domestic fuel and electricity is a worthy cause for the government. There are still vulnerable populations located in isolated areas where their remoteness has kept them from benefiting from the FISE Program. Based on the interviews, the program appeared to have substantially improved the accessibility and the efficiency of purchasing LPG in rural areas. The average wait time for a FISE member receiving their refill was forty five minutes. The beneficiaries did express concern that the FISE program could end abruptly for before the real benefits materialized, if there is a change in Government.

KEY FINDINGS ON FISE

FISE is effective in meeting its goal of providing fuel access in the form of LPG to the Peruvian population that it is designed to serve. This is the segment of the population that is considered to be ‘vulnerable’. The intent of the program is to shift energy consumption for domestic purposes away from traditional biomass (e.g., firewood, animal waste) toward commercial fuels.

FISE does not substantively increase the consumption of fossil fuel. The APRP was asked to examine the effectiveness of fossil energy subsidies. It is the consensus opinion, based on the facts presented, that FISE is well targeted and does not result in the wasteful consumption of fossil fuels.

The Cuzco pilot for FISE rollout was a well thought out and successful beginning program. As part of the roll out of FISE, Peru designed a pilot program in the Cuzco region to fine-tune the program and to work out any issues before the larger introduction of the program for all of Peru. The successful pilot allowed the government to make changes to the program such as eligibility requirements. The pilot and the ongoing efforts to improve upon the design and implementation of the program are critical to its success.

FISE has been successful in its outreach and communication to eligible groups. The effort that Peru has taken for contacting vulnerable groups (in occasionally hard-to-reach locations) is to be commended for being effective in incorporating these target groups and needy individuals into the program. Additionally, the government has been effective in enrolling LPG marketers into the program.

FISE is a good model for other similar government programs. The success of FISE can be used as a model for other similar government programs. For example, the use of electricity bills to screen for screening potential beneficiaries of the program can be applied to other programs. This innovative approach—as compared with similar programs in other economies, such as Indonesia—is much more efficient. However, it should be noted that the threshold of electricity usage (less than 30 KWh/month) might not be appropriate for some parts of Peru, such as Amazon regions. In these cases, even the vulnerable poor may be using more than this amount due to the nature of their electricity needs.

Economic costs of cross subsidies for FISE revenue are unclear. Currently, FISE is financed with a cross-subsidy or surcharge on other participants in the energy system. These resources are placed in a trust managed by OSINERGMIN. These cross subsidies offer a relatively easy revenue raising measure for the Government. APRP notes the significant size of Peru’s informal economy (approximately 40% of GDP) that is not taxed on the basis of income. On this basis, the current cross subsidies may be the most effective means of raising revenue for this program. However, the costs of these cross-subsidies on the rest of the economy are not understood.

There are unintended charges that should be addressed. As with any new program there are unintended consequences. In this case, it is with multiple charging on intermediate products, which results in charges on both input and output products. Additionally, if an exported commodity is initially transferred to another domestic intermediary, this commodity is also charged.

Impacts on FISE recipients have been positive. Members of the APRP visited some of the beneficiaries of FISE. These individuals appreciate the program and confirmed that it is

very beneficial to them, both financially and in terms of the health benefits that the scheme provides.

END GOAL/VISION

The APRP believes that the FISE program should continue and that the current efforts in examining methods for improving the program should continue. Further, that FISE should be rapidly expanded to other vulnerable segments of the population that are not being served by FISE at present.

RECOMMENDATIONS

The APRP findings have suggested the following recommendations that continue to support the FISE subsidies given the targeted nature of the subsidies.

Recommendation 11: Accelerate rollout of the program. The continued development of the program is critical to its success. All regions in Peru must be able to participate. In particular, mechanisms must be developed to incorporate the vulnerable poor in regions where they do not have access to electricity. Thus, it will be necessary to develop new threshold requirements for these groups.

Recommendation 12: Review eligibility criteria and automatically update subsidy values over time. Eligibility requirements for FISE participants should be reviewed along regional lines. For example, it may be that the 30 KWh/month thresholds for electricity use should be increased for the vulnerable poor in the Amazon regions. It should be noted that, based on exit interview discussions with OSINERGMIN management and staff, these discussions are now occurring. Furthermore, given that the subsidy value is currently fixed, the government may want to update these values on a regular basis to keep up with inflation and LPG price changes over time.

Recommendation 13: Expand the LPG distribution network. The distribution network of authorized agents for LPG should be expanded. Information from MIDIS could be used in this regard. This effort would also tie to the government's objectives for expanding the regions for natural gas distribution and connectivity to the electricity grid. The APRP has recommended (see Recommendation 5) that the packaged LPG that is currently part of the FEPC program be transferred to FISE. During a transition period between the FEPC and the FISE, some higher-income social groups can be added to FISE on a temporary basis while they adjust to market-driven prices. These additional participants may require an expanded distribution program under FISE.

Recommendation 14: Conduct a detailed cost-benefit analysis of FISE. FISE is a relatively new program; and, there may be some unintended consequences associated with it that are not apparent at this time. At some point—when sufficient information on the operation of the program activities has been obtained—a cost-benefit analysis should be done. This should include an examination of indirect costs associated with the program. An examination of cross subsidies—and a related analysis to determine whether or not direct taxation for FISE would be more effective—should also be performed.

Recommendation 15: Track status of recipient households. One significant reason for developing this program is to provide the vulnerable poor with an energy resource for cooking in order for them not to need to spend significant amounts of time obtaining traditional biomass fuels. While it is likely that many in the program will remain there for

years, the government hopes to see some of the households leave the program. This is because these recipients could use their newfound time to gain employment. In that manner, their income will rise and they will no longer need to be part of the program. This will be a metric for success in the future. Also, metrics ascertaining improvement in the health of these recipient households over time should be collected.

Recommendation 16: Continue to hold periodic stakeholder meetings to solicit feedback on FISE implementation. The communications in commencing the FISE program have been effective. The outreach to stakeholders should continue in order to continuously improve program operations. These consultations should include, but may not be limited to, government agencies such as MINEM, MEF, MIDIS, and OSINERGMIN, as well as private sector groups. While many topics can be discussed, two of importance will be how revenues are raised to fund the FISE and the determination of any revisions to the eligibility requirements. During the close-out interviews with the governmental ministries, the APRP was informed that these discussions are already occurring.

Recommendation 17: Expand the FISE model. The effective approach taken by FISE government managers could be applied to other activities related to energy use and related assistance to vulnerable groups. In particular, some of the APRP recommendations in other areas could utilize the FISE model. For example, the incremental approach utilized in the FISE Cuzco pilot program is a model for incrementally developing and implementing a government program. The nature of the outreach and communications was also critical for the successful rollout of the program in its ability to access and identify vulnerable groups and individuals that are often difficult to contact.

LESSONS LEARNED AND BEST PRACTICES

This section presents some of the key lessons learned and best practices for supporting the APRP recommendations above. A useful lesson is that creative subsidy plans can be successful.

Rural Electrification in Chile

Chile started a rural electrification program in 1994 that sought to promote private investment and stimulate competition (World Bank 2000). The Plan was based on high-level, multiple-year financial and political commitments from various central government agencies and allowed strong buy-ins from regional governments. Through this program, Chile created a fund to “competitively allocate a one-time direct subsidy to private electricity distributing companies to cover part of their investment costs in rural electrification projects” (World Bank 2000, p. 76).

This fund attracted private firms to provide electricity services to rural populations. Distribution companies presented their project plans to the regional governments, who then allocated the subsidy funds to companies that scored the highest on several criteria, such as cost-benefit breakdown, contributions of the company, and impacts to society (World Bank 2000). The Chilean government supported the electrification program by providing funding (\$500 million) while government agencies supported the program by giving technical assistance to local governments to establish rural electrification projects (IEA, OECD, and World Bank 2010). The Chilean central government allocated the subsidy funds to each region based on the extent of that region’s progress in rural electrification and the number of households still lacking electricity.

The program's goals also included improving social equity and improving the living conditions of the poor. The program demonstrated that market incentives can lead to "efficient private solutions to rural electrification" (World Bank 2000). Based on Chile's successful and innovative rural electrification scheme, many economies are adopting similar output-based aid reforms.

As Peru considers the expansion of the electricity grid and LPG delivery into the rural Sierra and Amazon areas, it could consider the approach taken by Chile to get private investment to flow into such areas.

Phasing Out LPG Subsidies in the Long Term

The FISE subsidies for LPG in Peru are currently useful to move the poor from consuming inefficient fuels for energy to a more efficient and cleaner fuel. As noted in the recommendations above, the FISE program is relatively new and additional studies need to be conducted to assess its impacts. If, at this stage, it is determined that some of the subsidies may need to be phased out, then the removal of the subsidies need to be combined with broader reforms. For example, Jordan removed fossil fuel subsidies but increased the minimum wage, allowing low-paid government employees to receive greater wage increases than employees those with higher salaries. One-time bonuses were also provided to low-income earners (IEA, OECD, and World Bank 2010). These measures helped reduce resistance to reforms. However, as noted in the findings and the recommendations, the APRP is recommending an expansion of the FISE program at this stage. The phasing out of the subsidies is a longer term goal that depends on the outcome of future studies. Removal of targeted subsidies needs to be considered as part of a broader strengthening of the social safety net for the vulnerable poor.

Electricity-Based Cross-Subsidies for Poor Populations

It should be noted that the U.S. state of California, under the deregulation of its investor-owned utilities' electricity grid, requires a small percentage to everyone's electricity usage to provide assistance to poor households in becoming more energy efficient. This has proved to be a politically and operationally successful program since its inception in 1997. Similar percentages are often added to electricity bills in a number of different utilities in the U.S. and elsewhere, to provide assistance to poor households. Therefore, the approach that Peru has taken to subsidize FISE is quite common.

8. CONCLUSION

The first APEC IFFRSR/VPR in Peru was conducted successfully, with significant interest and active engagement of Peru in the APEC process. The results of the peer review are documented in this report.

Peru selected three important fossil fuel subsidies for review by the APRP. Based on a review of the background material submitted by Peru and developed by the Secretariat, the APRP concluded that two of the subsidies, namely the VAT exemption for fossil fuels in the Amazon regions and the Fuel Stabilization Fund (FEPC), should be removed. The VAT exemptions in the Amazon region have led to wasteful and inefficient use of fossil fuels, and it has not met its goal of increasing economic development in the Amazon region. The FEPC has likely resulted in greater fossil fuel consumption than would otherwise have been the case. The series of reforms to the FEPC since 2008, including the removal of a number of oil products from the scheme, provides a template for future reform and the eventual removal of the FEPC altogether. Both the VAT exemption and the FEPC tend to be taken advantage more by the higher income population groups than by the poor.

In contrast, the subsidies for LPG through the FISE provided to vulnerable households should be maintained and expanded quickly to reach the targeted populations. The APRP finds that the FISE program does not substantially increase fossil fuel consumption and is instead beneficial to the targeted populations that it is intended to serve. Expanding the LPG subsidies to the vulnerable populations not currently covered is necessary to ensure that all regions in Peru are benefited by FISE. That said, once the FISE has been in operation for several years, the APRP recommends that a review be undertaken into the FISE to understand the direct and indirect costs of the cross subsidy on other sectors of the economy.

The APRP developed 17 recommendations for reforming the three fossil fuel subsidies in Peru. APRP carefully considered the recommendations in order not to be too prescriptive, and the recommendations represent the compromise position agreed to by all APRP members. There are a few linkages among the various APRP recommendations for all three subsidies, and therefore, reform strategies for each of the subsidies can be considered in tandem. In order to reform the VAT exemptions for the Amazon, the APRP suggests that Peru consider removing fossil fuel exemptions as an initial step toward a broader tax reform package that may involve removal of all VAT subsidies. There is sufficient capacity within Peru to assess the broader VAT exemptions, as indicated by the extensive and ongoing studies on this issue. VAT removal should be combined with the establishment of funds for specific social and infrastructure investments in the Amazon. The APRP does not identify specific programs and investments, because the APRP believes that Peru is in the best position to determine the appropriate compensation packages.

Removal of the FEPC should be considered in a phased manner, with the transfer of packaged LPG from FEPC into the FISE scheme. Similarly, diesel for public transport could also be removed from FEPC and moved into an expanded FISE program. In order to control

inflation, APRP recommends that other macroeconomic tools be used rather than price controls on fuels. Communication is a crucial issue for the removal of both subsidies, and the government should develop a coherent communication plan once a specific strategy is agreed upon.

FISE is a relatively new program in Peru, but it has shown itself to be successful. The government has undertaken steps to ensure that the program is revised based on pilot studies and lessons learned through its implementation thus far. It is recommended that the FISE continue to be expanded and refined to ensure that it reaches all of the vulnerable populations. The LPG distribution network should be expanded, as part of accelerating the rollout of the program. As noted above, all LPG subsidies should be incorporated within the FISE, and similarly subsidies for specific sectors can also rely on the already established FISE operational mechanisms.

The report provides examples of how other jurisdictions had managed similar challenges facing Peru. These specific lessons learned and best practices can be used by Peru in developing its implementation plans for reforms. Peru has been undertaking subsidy reforms in a progressive fashion for many years, and the APRP recommends a continuation of these reform efforts for the remaining subsidies in place, along with further reviews and analyses of the subsidies over time. Peru already has well established mechanisms for interministerial coordination, and these mechanisms need to be used to have focused discussions among relevant ministries on the APRP recommendations. A coherent plan with specific policy options and implementation strategies should be developed and executed through these intergovernmental mechanisms.

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APPENDIX A. APRP MEETINGS FOR IFFSR MISSION, JUNE 2014

Table A–I. Final Agenda

	Monday	Tuesday	Wednesday		Thursday	Friday
9 - 9.30 am.	Initial Technical Meeting. Participants: MEF, MINEM, OSINERGMIN. Venue: MFA. Agenda: Logistics and procedures for the mission. Discussion of preliminary findings at a technical level, agenda.	Technical Meeting: Rural Electrification. Participants: DGER, MEF (DGAEICYP). Venue: MINEM	High Level Meeting with Gian Carlo Gasha - Vice Minister of Economy. Participants: MEF (DGPIP, DGPMAC, DGAEICYP)	Site Visit: Beneficiaries of the FISE program. Venue: Outskirts of Lima, Ventanilla.		Closing Technical Meeting: MEF, MINEM, OSINERGMIN. Venue: MFA Agenda: Discussion of findings from the mission and next steps.
9.30 - 10 am			Meeting with MINAM.			
10-10.30 am			Participants: MINAM MEF(DGAEICYP) Venue: MEF			
10.30 -11 am	Technical Meeting: Stabilization Fund. Participants: DGH, DGE, DGEE, OSINERGMIN (GART) , MEF (DGAEICYP, DGPMAC) Venue: MINEM			Closing meeting: MEF, MFA, MINEM, OSINERGMIN. Level: Director Generals and President of Osinergmin. Venue: MFA		
11- 11.30 am						
11.30 am -12 pm						
12- 12.30 pm	Opening meeting: MEF, MFA, MINEM, OSINERGMIN. Level: Director Generals and President or General Manager of Osinergmin. Venue: MFA	High Level Meeting with Edwin Quintanilla - Vice Minister of Energy. Participants: MEM (DGH, DGE), MEF (DGAEICYP). Venue: MINEM				
12.30 - 1 pm						
1 - 1.30 pm						
1.30 - 2 pm						
2 - 2.30 pm						
2.30 - 3 pm						
3 - 3.30 pm	Interview with Carlos Prieto - Author of the VAT Exemption Apoyo Consultoria Report. Venue: MEF	High Level Meeting with Julio Salvador Jacome - General Manager, Phd. Arturo L. Vásquez Cordano - Economic Studies Manager of OSINERGMIN. Participants: MEM (DGH, DGE) MEF (DGAEICYP). Venue: OSINERGMIN	Meeting with stakeholders: Private Sector. National Society of Mining, Pretroleum and Energy (SNMPE) - Caterina Podestá - General Manager of the Society and representatives from hydrocarbons and energy companies. Venue: MEF (Sala VME)			
3.30 - 4 pm						

	Monday	Tuesday	Wednesday	Thursday	Friday
4 - 4.30 pm	Technical meeting: Amazon VAT Exemption. Participants: MEF (DGPI, DGAEICYP), MINEM. Venue: MEF	Technical Meeting: LPG Subsidy (FISE) - focalization process.MEF (DGAEICYP), OSINERGMIN Venue: OSINERGMIN	Meeting with MIDIS and Social Programs and DGIP Representatives . Venue: MEF (Sala VME)		
4.30 - 5 pm					
5 - 5.30 pm					
5.30 - 6 pm					

Table A-2. Participants

Meeting	Venue	Participant	Position	Institution
Initial/Closing Technical Meeting	MFA	Jose La Rosa	Director of Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
		Victor Murillo	Manager of FISE	FISE - OSINERGMIN
		Ines Priale	Operations Manager	FISE - OSINERGMIN
		Cecilia Fernandez	Specialist	MINEM
Opening/Closing Meeting	MFA	H.E. Ambassador Alberto Patiño	Peruvian High level representative to APEC	MFA
		Javier Roca	Director General of International Economic Affairs, Competition and Productivity	MEF
		Juan Israel Ortiz	Director General of Hydrocarbons	MINEM
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	MEF
		Jesus Tamayo	President of Board of Directors	OSINERGMIN
		Julio Salvador	General Manager	OSINERGMIN
		Natalia Rojas	Consultant	MEF
		Victor Murillo	Manger - FISE	OSINERGMIN
		Ines Priale	COO - FISE	OSINERGMIN
		Cecilia Fernandez	Specialist	MINEM
		Rocio Casildo	Adviser	MFA
Amazon VAT Exemption Report Meeting	MEF	Carlos Prieto	Consultant	World Bank
		Jose La Rosa	Director of Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
Technical Meeting: Amazon VAT Exemption	MEF	Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF

Meeting	Venue	Participant	Position	Institution
		Irene Gonzalez	Director of Consumption and Taxation of International Trade	DGPIP - MEF
		Marisela Rivera	Consultant	DGPIP - MEF
High Level Meeting with Vice Minister of Energy	MINEM	Edwin Quintanilla	Vice Minister of Energy	MINEM
		Juan Israel Ortiz	Director General of Hydrocarbons	DGH - MINEM
		Luis Antonio Nicho Diaz (TBC)	Director General of Electricity	DGE - MINEM
		Cecilia Fernandez	Specialist	DGH - MINEM
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
Technical Meeting: Renewables and Rural Electrification	MINEM	Representative of DGEE (To be designated by authorities)		MINEM
		Representative of DGER (To be designated by authorities)		MINEM
		Cecilia Fernandez	Specialist	MINEM
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
Technical Meeting: Stabilization Fund	MINEM	Raquel Zuñiga	Director of Production, Transmission, and Commercialization of Hydrocarbons and Biofuels	DGH - MINEM
		Javier Cubas	Specialist	DGH - MINEM
		Cecilia Fernandez	Specialist	DGH - MINEM
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
		Luigi Butrón	Consultant	DGPMAC - MEF
		Representative from GART (Name to be announced)		GART - OSINERGMIN
High Level Meeting: OSINERGMIN	OSINERGMIN	Julio Salvador	General Manager	OSINERGMIN
		Arturo Vazquez	Manager of Economic Studies	OSINERGMIN
		Victor Murillo	Manager of FISE	FISE - OSINERGMIN
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
Technical Meeting: FISE	OSINERGMIN	Victor Murillo	Manager of FISE	FISE - OSINERGMIN

Meeting	Venue	Participant	Position	Institution
		Ines Priale	Operations Manager	FISE - OSINERGMIN
		Specialist from FISE (name TBA)	Specialist of FISE Focalization	FISE - OSINERGMIN
		Carlos Tovar (TBC)	Director General of Management of Users (SISFOH)	MIDIS
High Level Meeting: Vice Minister of Economy	MEF	Gian Carlo Gasha	Vice Minister of Economy	MEF
		Laura Calderon	Adviser to the Minister (Former Vice Minister of Economy)	MEF
		Javier Roca	Director General of International Economic Affairs, Competition and Productivity	DGAEICYP - MEF
		Cesar Liendo	Director General of Macroeconomic Policy	DGPMAC - MEF
		Marco Camacho	Director General of Public Income	DGPIP - MEF
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
Meeting with MINAM	MEF	Representative From MINAM (name TBA)	Director General of Climate Change, desertification and water resources.	DGCCDRH - MINAM
		Jose La Rosa	Director for Normative Efficiency for Productivity and Competition	DGAEICYP - MEF
		Natalia Rojas	Consultant	DGAEICYP-MEF
Meeting with Private Sector	MEF	Caterina Podestá	General Manager	National Society of Mining, Petroleum and Energy
		Representatives from companies (names TBA)		
Meeting with MIDIS, Social Programs and Public Investment	MEF	Beatriz Robles	Director General of Decentralization	MIDIS
		Ana Alvarado	Executive Director of Juntos Program	MIDIS
		Joselyn Valer	Executive Director of FONCODES	MIDIS
		Jessica Soto	Executive Director of Cuna Mas Program	MIDIS
		Representative of DGIP (name TBA)		DGIP - MEF

APPENDIX B. SUMMARIES OF APRP MEETINGS IN LIMA, PERU

Sunday, June 22, 2014, 11:00-1:30pm

Initial Team Meeting

The APRP and the Secretariat kick-started their week of activities with an internal meeting to learn about each other's background and understand each individual's perspective on the three subsidies that Peru selected for review. The following questions were discussed:

- What were the APRP member's potential biases and approach to such peer review processes?
- If the subsidies were not in place, how would that affect the development of the Amazon?
- What are the drivers of development in the Amazonian region?
- Is there a better method to achieve economic development in the region?
- How can the VAT be support those who are more poor than the higher income groups?
- How can leakage to surrounding areas be prevented?

The initial team meeting also discussed the issue of cross subsidies with regard to the second subsidy for LPG, or FISE. In general, the team aimed to learn more about these subsidies over the coming week to better comprehend the nuances of each subsidy and to suggest improvements.

Monday, June 23, 2014, 9:30-10:30am

Initial Technical Meeting

The APRP had its first meeting with the Peruvian counterparts at the Ministry of Foreign Affairs. Representatives from the Ministry of Economy and Finance, the Energy and Mining regulator, OSINERGMIN, and the Ministry of Environment were present to discuss the logistics of the weeklong meetings, as well as to begin the discussion on the three subsidies selected for review. The conversation began with introductions and then switched to filling in some of information gaps, along with the request of certain technical documents from the Government of Peru.

The team discussed with Victor Murillo, Manager of FISE and Ines Priale, Operations Manager under FISE, the possibility of meeting the beneficiaries of the FISE program who live in the outskirts of Lima. The team decided that two people from the APRP team would visit FISE beneficiaries on Wednesday morning, June 25, 2014.

The meeting then led to a discussion on the several challenges surrounding the Amazon VAT subsidy, including illicit trade, the constitutionality of the tax exemption, and the lack of public investment on much needed education and health programs. The team learned that the tax exemption was intended to be short-termed, however, every three years Congress would vote to extend the subsidy. The team discussed whether lessons learned from the FISE program could be adapted to the Amazon VAT subsidy. The team also discussed the capacity of Peru's refineries and the natural gas project in Camisea.

The team subsequently prepared for the official opening meeting.

Monday, June 23, 2014, 11:00am - 1:00pm

Opening Meeting

The opening meeting with high-level officials from the relevant Ministries and governmental bodies began with introductions of the participants and the description of roles of each entity involved in the IFFSR process. The Peruvian counterpart stated their reasons for participating in the IFFSR Peer Activity, which included:

1. To eliminate perverse incentives
2. To improve the economy's health and ensure that the stabilization of prices will not adversely affect poor people
3. To decrease energy and fossil fuel consumption for the betterment of the environment

The Peer Review Team and APEC Secretariat reiterated their objectives with this trip and the peer review process.

Monday, June 23, 2014, 3:00 - 4:00pm

Technical Meeting: Amazon VAT Exemption Report

The group met with Carlos Prieto, author of the Amazon VAT Exemption Report in 2002 for MEF. This report by Apoyo Consulting was updated in 2006. More recently, the World Bank funded another study on the VAT exemptions in 2012.

The meeting focused on why the VAT was implemented and why this contentious tax exemption is still in place today. The VAT tax exemption was introduced in the late 1990s as a populist measure to help mitigate the effects of El Niño and the Asian crisis, both hurt the Peruvian economy.

The group discussed the main bottlenecks affecting the areas where the tax exemptions are applied, including lack of infrastructure, accessibility issues (i.e., one can only travel by plane or river transport), the high cost of doing business, and the lack of competition among businesses.

The meeting also discussed mining and how illegal mining has become an important activity in Madre de Dios.

The timing of when to remove the VAT was deliberated based on the imminent local elections that are to take place in October. Removal of the VAT would imply low popularity rates for local politicians. One possible window may be at the beginning of next year starting in Madre de Dios.

Monday, June 23, 2014, 4:00–6:00pm

Technical Meeting: Amazon VAT Exemption

APRP met with two representatives of the Ministry of Economy and Finance Office of Public Income (DGPI) to discuss the VAT exemption. Ms. Irene Gonzalez, the Director of Consumption and Taxation of International Trade explained that Peru declared lifting the VAT exemption unconstitutional because this political action had not considered the opinion of Congress.

An important topic during this discussion was how to remove the overall VAT exemption. The following scenarios were contested: gradual removal with a step-by-step process or commence with the removal of fossil fuels as the first group of subsidies. Nonetheless, it was agreed that further analysis is needed to determine whether dividing the whole VAT exemption package piece by piece would be the most efficient approach.

Tuesday, June 24, 2014, 9:00–10:00am

Technical Meeting: Renewables and Rural Electrification

This meeting took place at the Ministry of Energy and focused on the implementation of isolated grids and energy initiatives in the rural areas of Peru. The team met with Engineer Ruben Aquino, who informed the team about Peru's ten year Rural Electrification Plan (2014-2023). The Plan delineates the percentage use of rural electrification between urban (90 percent) and rural (70 percent) areas. The Ministry of Environment predicts that the use of electrification in rural areas will increase to 96 percent by 2016. This increased electrification will be accomplished by the Government through the installation of solar panels in 500,000 homes. Nationwide, this plan would cost about \$1,000 per household for the installation of solar panels and \$2,000 per household for the installation of conventional grids. The Ministry is working very hard to meet its 2016 target as well as to extend the deployment of solar panels and conventional grids in the Amazon. However, expansion has been slow and capacity building has been insufficient.

Mr. Aquino explained that initial projects in solar power installations have failed because the government did not properly train people. This problem is an extension of a bigger problem, which involves the lack of public funds, from the Ministry of Environment and the Ministry of Economy and Finance, to provide technical assistance in building capacity for rural electrification projects. Mr. Aquino agreed that technical assistance would be very helpful in meeting the Rural Electrification Plan's targets.

Mr. Aquino also informed the team that contracting firms have investigated the possibility of implementing hydroelectric systems, however, these firms have found hydroelectric systems to be too complicated to use at this time. Further investigation of hydroelectric systems is required in order to consider them as an alternative source of energy.

Tuesday, June 24, 2014, 10:00–11:00am

Technical Meeting: Stabilization Fund

During this meeting, the APRP had an in-depth discussion on the second subsidy, the Fuel Price Stabilization Fund. BLANK and Oscar A. Echegaray Pacheco, specialist from the Division of Natural Gas under OSINERGMIN, presented during this meeting. The presentations covered the history of the Stabilization Fund and its purpose, the common pricing practices of Peru's two biggest fuel producers, and the "band" mechanism used by the government to stabilize energy prices.

The team discussed several reform ideas, including transferring the Fund from diesel to natural gas for transportation usage to take advantage of the natural gas reserves. Another suggestion was to remove LPG from the Stabilization Fund and support LPG subsidies under FISE.

Tuesday, June 24, 2014, 11:00am–12:00pm

High Level Meeting with Vice Minister of Energy

In this meeting, Vice Minister of Energy, Edwin Quintanilla welcomed the APRP. Mr. Quintanilla provided a PowerPoint presentation on the Stabilization Fund and presented statistics on Peru's use of natural gas.

According to his presentation, Peru is ranked number one in South America for energy competitiveness but is ranked last for its energy coverage. The government aims to have 95 percent of its population have access to energy, particularly to natural gas.

Tuesday, June 24, 2014, 3:00–5:00pm

High Level Meeting: OSINERGMIN

The meeting focused on the roles of OSINERGMIN and the third subsidy, FISE.

Victor Murillo, the Manager of FISE, gave a PowerPoint presentation which covered the political aspects of FISE and how it operates.

Tuesday, June 24, 2014, 5:00–6:30pm

Technical Meeting: FISE

A presentation was given by a private sector representative to outline the successful use of cell phones as the communications strategy of the FISE program.

Wednesday, June 25, 2014, 8:00–11am

Visit to the FISE Beneficiaries

Kimberly Ballou and Gusti Sidemen from the APRP team visited the beneficiaries of the FISE program in Ventanilla – Pacha Cuteck, outside Lima. The team, accompanied by members of OSINERGMIN and Edelnar (Peruvian Energy company), interviewed the beneficiaries' to understand the impacts that this subsidy has had on their daily lives. The team identified three important findings:

4. Considering demographic and geographical location of Peru's vulnerable populations, the rationale of FISE program is still valid. Supporting a cross subsidy program to provide access to clean fuel is a necessary and justifiable act of the Government. It is evident that Peru carefully selected the target population for this subsidy. A good starting point is tying the LPG program to a threshold of a maximum consumption of electricity. The existing technology and mechanism in place seems to work as intended. However, there is speculation that the program has not yet reached the most vulnerable populations. The communities located in remote areas where basic services are not available are not yet benefiting from the program.
5. This program has substantially improved access to LPG. Before the program existed, it take a lot of time for the consumer to buy LPG as they sought to find the best price among several agents. With the program, consumers need only to make a phone call in order to have the LPG refilled. However, the program is set up so that the consumer can purchase one 10-kg LPG canister at a time. This mechanism helps prevent excessive consumption.
6. The FISE program, especially the LPG voucher program, also improves the air quality and the health of vulnerable populations. Considering that most of the FISE beneficiaries live in houses that do not have a separate kitchen, alternative energy sources, such as

pipled gas, may also achieve the same objectives. However, improved access to pipled natural gas in these types of areas may be more costly to the government.

7. During the site visit, the peer review team acknowledged the beneficiaries' concerns that the program could end as well as the possibility that beneficiaries could abruptly lose their benefit for electricity usage over 30 kWh..

Wednesday, June 25, 2014, 9:00–10:00am

Technical Meeting: MEF

The IFFSR Peer Review team and APEC Secretariat were scheduled to meet with High Level officials from the Ministry of Economy and Finance; however, the officials were called into Congress that day and were not able to attend.

The team changed topics to discuss Peru's macroeconomic framework and PPP methodologies with a couple of representatives from the MEF. The MEF has published Peru's Macroeconomic Medium Term Framework on its website and plans to introduce a new law in 2015 to build PPPs to reduce fossil fuel subsidies and provide more resources to the education and health sectors.

The introduction of a devolution mechanism with producers over time was a possible solution that was discussed with regard to the Stabilization Fund. The team also learned that PetroPeru is the only oil company that distributes oil in the Amazon.

Wednesday, June 25, 2014, 3:00–4:30pm

Meeting with Private Sector

This meeting involved a discussion with representatives from the National Society of Mining, Petroleum and Energy. This society includes big companies within the different segments of the energy and hydrocarbons industry.

Wednesday, June 25, 2014, 4:30–5:30pm

Meeting with MIDIS, Social Programs, and Office of Public Investment

The team met with representatives from the Ministry of Social Inclusion, as well as the social programs, Cuna Mas and Puntos.

Cuna Mas is a program that works with children, under 3 years of age and living in poverty, in order to improve their cognitive, social, physical, and emotional development. Cuna Mas is available in the regions of Loreto, Ucayali, and Amazonas. Cuna Mas is available only in the communities that allow their intervention and allow the program to work with their children. Cuna Mas works with approximately 90 thousand families. The challenges for this program include accessing the poor living in remote areas and identifying with local concerns. In addition, river transport and intervention is very costly. Then, overcoming cultural barriers is very important because those who work under Cuna Mas must be able to speak the local language and respect the traditional customs of child upbringing. These challenges make it difficult to ensure health control in these regions.

Juntos is another program under MIDIS that provides families with monetary incentives once families have complied with a set of criterion, including completing education, visiting health centers for checkups, and more.

The conversation focused on what impacts the reduction of fossil fuel subsidies will have on the families that these programs support.

Then, the team discussed the challenges associated with PPPs with a representative from the Office of Public Investment.

Friday, June 25, 2014, 9:00–11:00 am

Closing Technical Meeting

The APRP Team Leader, Terry Surles, presented the findings and recommendations of the team based on the information learned during the week of meetings with technical experts,. MEF staff provided initial comments on the presentation.

Friday, June 25, 2014, 11:30–12:30pm

Closing Meeting

The team had their last meeting with the High-Level officials that were present in the opening meeting. The team presented their findings and recommendations, and the Peruvian counterparts provided their comments.

Both parties thanked each other for their collaboration in this activity and the Peruvian counterpart expressed their gratitude. The Peruvians look forward to reading the final report.

APPENDIX C. PEER REVIEW TEAM MEMBERS

FFSR TEAM LEADER

- Dr. Terry Surles

FFSR TEAM MEMBERS

- David Buckrell
- Dr. Han Phoumin
- I Gusti Suarnaya Sidemen
- Kimberly Ballou

FFSR SECRETARIAT

- Dr. Ananth Chikkatur
- Dr. Lorna Greening
- Alexandra Jamis
- Jeannette Paulino

FFSR TEAM LEADER

Dr. Terry Surles

Terry Surles is the FFSR Team Leader for this Project. His main expertise is in the implementation of renewable energy and energy efficient systems. Dr. Surles has over 30 years of experience working in the sustainable energy and climate change sectors. Dr. Surles is presently leading the Initiative on Sustainable Energy and Environmental Solutions (ISEES) at the University of Hawaii to promote the implementation of renewable energy and energy efficient systems, while working on issues such as water availability and water usage.

Ph.D. Analytical Chemistry, 1970
(Michigan State University, USA)

B.S. Chemistry, 1966 (St. Lawrence
University, USA)

Dr. Surles is also the senior adviser for the California Institute for Energy and Environment (CIEE), and is focused on developing smart grid technologies with utilities, state and federal agencies, and technology providers, as well as assisting the State of California in regional climate change assessments. He is also presently a clean energy consultant, adviser, or lecturer to several groups such as the United Kingdom Energy Research Centre Summer School, the State of Victoria (Australia), Joint Venture Silicon Valley, Agrion, Booz Allen Hamilton, the California Public Utilities Commission (CPUC), and the Northeast Asia Economic Forum. Dr. Surles has produced over 250 publications, technical papers, and presentations to his credit. He has also been invited to be a member on several influential committees and review groups, such as the United States Review of the Intergovernmental

Panel on Climate Change (IPCC) Report on Renewable Energy Resources and Climate Change Mitigation. He has worked for the U.S. Argonne National Lab (ANL), the Lawrence Livermore National Laboratory (LLNL), the California Environmental Protection Agency (Cal/EPA), the California Energy Commission (CEC), and many other federal, state, and academic organizations.

FFSR TEAM MEMBERS

David Buckrell

David Buckrell is a FFSR team member for this Project. David is the Principal Policy Adviser at New Zealand's Ministry of Business, Innovation and Employment (MBIE). His work focuses on providing analysis and advice on policy settings and market developments in New Zealand's upstream

Masters in Economics and Finance, 2001
(Institut d'Etudes Politiques de Paris,
Paris, France)

B.A. Politics, 1998 (Victoria University of
Wellington, Wellington, New Zealand)

exploration, natural gas, and downstream petroleum sectors. David has provided policy input to New Zealand's royalty regime concerning petroleum and minerals, MBIE's Organisation of Economic Co-operation and Development (OECD) draft analysis on fossil fuels in New Zealand, MBIE's review of tax rules for nonresident offshore rig operators in the petroleum and "specified mineral" sector, the International Energy Agency's (IEA) Emergency Response Review of Japan, and a review of New Zealand's Crown Minerals Act. David was previously an energy consultant at the Washington-based PFC Energy, where he focused on global midstream, refining and marketing issues, and specialized in the midstream and downstream sectors of the Former Soviet Union.

Dr. Han Phoumin

Han Phoumin is a FFSR team member for this project. Han has over 15 years of experience working at various international and intergovernmental

Ph.D. Economic Development and
Policies, 2007 (Kobe University, Japan)

organizations, as well as multidisciplinary research consortiums related to poverty, governance, integrated water resource management, economic development, and energy economics for the Association of Southeast Asian Nations (ASEAN) and East Asia. Han specializes in economic development and policy and applied econometrics. His knowledge and interests have extended to renewable energy including biofuels, energy efficiency and savings, energy security, energy consumptions and forecasting, and water resource development and management. Currently he is leading a numbers of energy efficiency projects, such as the Energy Outlook, Clean Coal Technologies, Power Infrastructure Connection, and Energy Market Integration in EAS region, where price mechanism and energy subsidies are among the subjects of study. Han is presently an Energy Economist at the Economic Research Institute for ASEAN and East Asia (ERIA).

I Gusti Suarnaya Sidemen

I Gusti Suarnaya Sidemen is a FFSR team member for this project. He is the Deputy Director for the Republic of Indonesia's State Petroleum Revenue Management, at the Directorate General of Oil and Gas (MIGAS) of the Ministry of Energy and Mineral Resources. His main duties involve

LL.M Petroleum Law and Policy,
2002 (University of Dundee,
Scotland)

working with production sharing contractors, the Ministry of Finance, the Ministry of Interior, and regional governments to calculate and verify the state's revenue from petroleum exploration and production. He also works to calculate and verify revenue allocations for regional governments. His work also focuses on Indonesian Crude Oil Pricing (ICP), and state budget from petroleum formulation. In addition to this work, Gusti is currently involved in energy supply demand analysis, energy planning and policy development, and strategic petroleum stock filling assessment.

Prior to his current position, Gusti was the Deputy Director for Petroleum Transportation Regulation, where his main responsibilities included licensing, monitoring, and evaluating fuel market, gas transmission, and distribution. Gusti is an offshore engineer that graduated from the Sepuluh Nopember Institute of Technology, Surabaya (ITS) and has also received training in various aspects of the oil industry, such as environmental health and safety, quality assurance, petroleum taxation and fiscal system, downstream industry regulation, etc.

Kimberly Ballou

Kimberly Ballou is a FFSR team member for this Project. Kimberly is currently the Coordinator of International Programs at the U.S. Department of Energy's (DOE) Office of International Affairs.

Kimberly currently manages international cooperative activities with foreign governments, and multinational/international organizations as they relate to global energy governance and energy security. Kimberly has 12 years of experience in Federal service and is also the DOE's International Energy Agency (IEA) liaison and the United States representative to the IEA's Standing Group on Long-Term Cooperation (SLT) committee. Here she provides the U.S. perspective to the SLT committee, develops policy analysis of energy markets, examines policy options for reducing greenhouse gas emissions from energy production and use, and reviews IEA member countries' energy policies and programs. During her time at DOE Kimberly has also worked as a regional desk officer for European and Asian Affairs.

B.A. International Relations, 2003 (Notre Dame of Maryland University, USA)

M.A. Government, Political Communication, 2005 (Johns Hopkins University, USA)

FFSR SECRETARIAT

Dr. Ananth Chikkatur

Ananth Chikkatur is the leader of FFSR Secretariat for this Project. He is a manager with ICF International. Dr. Chikkatur has over 10 years of experience in energy and technology policy analysis, along with a strong background in technical and research expertise. Dr. Chikkatur's interests are diverse and varied, as indicated by the breadth of the projects he has been involved in and managed at ICF.

Ph.D. Physics, 2003 (Massachusetts Institute of Technology, USA)

B.S. Physics, 1997 (University of Rochester, USA)

Dr. Chikkatur has worked on several projects in the fields of power and fuel market analysis for project developers, utilities, governments, and other groups. Dr. Chikkatur was the deputy manager of a World Bank project in Mozambique to develop a "gas master plan" for the country, which involved a planning model, policy analysis, and recommendations. He also co-managed a large project for the Indian Ministry of Petroleum and Natural Gas to develop natural gas demand and design a natural gas pipeline grid for India. Dr. Chikkatur has worked

on and managed several projects with the European Commission and U.S. Environmental Protection Agency to develop Carbon Capture and Storage (CCS) related guidance documents and related reports. He has worked with the Global CCS Institute, Asia Pacific Economic Cooperation (APEC), and the Asian Development Bank in organizing workshops across the globe on CCS. He has supported the World Bank's Independent Evaluation Group to assess their project appraisal process for several coal-fired power projects.

Dr. Lorna Greening

Lorna Greening is a member of the Secretariat for this Project. Dr. Greening has well over 30 years of experience in the energy industry, including consulting, research, academia, the public utility industry, and the petroleum industry as an exploration geologist. She has performed projects for various U.S. governmental agencies including the Department of Energy (DOE), Environmental Protection Agency (EPA), U.S. Agency for International Development (USAID), and the Energy Information Administration (EIA), and such international donor organizations as the World Bank, in addition to various private clients.

Ph.D. Economics, 1992 (Colorado School of Mines, USA)

B.S. Geology, 1972 (University of Michigan, USA)

As an energy and natural resource economist, Dr. Greening has expertise on competitive markets for electricity (i.e., wholesale markets and transmission), and natural gas in the U.S. and internationally. Her experience includes renewable, distributed, and new conventional generation technologies in addition to conventional generation. Currently, she is the editor of *Energy Policy*, an international peer-reviewed journal addressing the policy implications of energy supply and use from their economic, social, planning and environmental aspects. In addition, Dr. Greening is a Research Fellow at the Howard Baker Jr. Center for Public Policy at University of Tennessee, Knoxville. She is also currently working as an energy economics consultant in Chattanooga, Tennessee.

Alex Jamis

Alex Jamis is a Research Assistant in the Energy Advisory and Solution group at ICF International, specializing in alternative fuels, advanced vehicles, and other petroleum reduction strategies in the transportation sector. Her work provides support to the National Renewable Energy Laboratory (NREL) and the U.S. Department of Energy (DOE). Prior to joining ICF, Alex worked in communications at the Solar Energy Industries Association (SEIA), where she maintained media relations, assisted with the execution of major report releases, and researched, wrote, and edited articles and other content on a broad range of energy, environment, and policy issues.

B.S. Environmental Science and Policy, 2012 (University of Maryland, USA)

Jeannette Paulino

Jeannette Paulino is a Research Associate for the trade facilitation unit of the International Development Economics practice of Nathan Associates where she supports the operations of USAID-funded projects in Egypt and Central America and a World Bank-funded project in West Africa. She has a diverse background in international development and business

B.A. Political Science, 2011 (University of Florida, USA)

development. As an intern for the OneVoice Movement, an international conflict resolution NGO, she contributed to fundraising and promotional efforts. In the summer of 2009, Jeannette was an intern for the ProWorld Service Corps in India, where she closely researched socioeconomic and emerging market trends. Having worked for a travel agency throughout and after college, Jeannette has experience in business development, marketing, and project management. She is a fluent Spanish speaker with intermediate ability in Italian.