APEC Peer Review on Energy Efficiency in Peru

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Outline

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Review Team

- **Mr. Kenji KOBAYASHI, Peer Review Team Leader, President, Asia Pacific Energy Research Centre (APERC).**
- **Mr. Titovianto WIDYANTORO, Senior Lecturer, Electricity and Renewable Energy Training Centre, Energy Division, Indonesia.**
- **Mr. Mohd FADZIL, Principal Researcher, Office of Chief Technology Officer, Coordinator for TNBR – University Collaboration, Malaysia.**
- **Mrs. Itha SANCHEZ, Researcher, Electric Research Institute (IIE), Cuernavaca, Morelos, Mexico.**
- **Mr. Prasert SINSUKPRASERT, Director of Planning Division, Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, Thailand.**
- **Mr. Brian CASTELLI, Executive Vice President, Programs and Development, Alliance to Save Energy, the United States.**
- **Mr. Joel HERNANDEZ, Researcher, Asia Pacific Energy Research Centre (APERC).**
- **Mr. Chandran SUNDARAJ, Researcher, Asia Pacific Energy Research Centre (APERC).**

PREE Activities in Peru

Monday 8 November

- **Energy Policy and Institutionality**
  - **Institutional Framework; Sustainable Energy Policy and Measures; Programs**
- **Energy Regulation**
  - **Legislative and Regulatory Framework; Energy Audit Mechanism; Training Program; Achievements; Future Plans**
- **Energy Efficiency and Institutional Context**
  - **Organisation Framework; Responsibilities and Planning; Implementation Programmes; Achievements; Future Plans**

PREE Activities in Peru

Tuesday 9 November

- **Renewable Energy & Rural Electricity**
  - **Achievements; Renewable Energy Policy; Rural Electricity Plan; Regulations**
- **Electricity Markets and EE Programmes**
  - **Electricity Referential Plans; Regulations; Achievements; Expansion Programmes; EE Strategies; Financing**
- **EE on Environmental Policy**
  - **Regulations and Standardizations; Technology Promotion and Application; Future Plans**

PREE Activities in Peru

- **EE in Mining**
  - **Current Programmes; Investments; Energy Future Demand; EE Strategies and Plans**
- **EE in Transport**
  - **Intermodal Plan in Transport; Future Plans; EE Policies**
- **NGO's and Energy Efficiency**
  - **Current Programmes and Projects; Promotion of EE; Financing; Capacity Building; Future Plans**

PREE Activities in Peru

Wednesday 10 November

- **EE Standards**
  - **Current projects; Financing; Achievements**
- **Energy Research & Development and Education**
  - **R&D National Plan; Economic Incentives; International Strategies; Education Plans**

Thursday 11 November

- **EE and Investments**
- **Energy Savings Programme (PAE) and Awards for Outstanding Energy Conservation**

PREE Activities in Peru

Friday 12 November

- Drafting of Preliminary Report

- Presentation of Draft Recommendations to Peruvian Officers

Energy Efficiency in Peru

Major findings

Institutional Context

- In May 2010, by Executive Decree No. 026-2020-EM, the General Directorate of Energy Efficiency (DGEE) was created as the technical regulatory body of Vice-Ministry of Energy in charge of proposal and assessment of energy efficiency and non-conventional energy policies.
- A proposal to create the Energy Efficiency Centre (CEE) which would be responsible for implementing demonstration projects is under consideration.

Energy Efficiency Goals, Targets and Strategies

- The "Efficient Use of Energy Promotion Law" of 2008 set the vision for the resurgence of a national energy efficiency plan which sees energy efficiency as a critical piece in the national interest.
- The "Energy Efficiency Use Referential Plan 2009-2018" set a target to reduce Peru's energy consumption by 15% by 2018.
- The Ministry of Energy and Mines (MINEM) has developed a "Proposed National Energy Policy for 2010-2040" which is being used as a guideline document for DGEE.

Energy Efficiency in Peru

Major findings

Energy Data Collection and Monitoring

- **Peru has a very well developed energy data that is reported in form of energy balance on selected sectors final energy use according to type of fuel.**
- **The Ministerial Resolution No. 038-2009-MEM/DM is a guide on energy consumption indicators and monitoring methodology for key economic sectors.**

Industry

- **Peru has carry out the development of energy standards for industrial equipments, however few standards have been officially announced but there are no promotional or regulatory activities to ensure the widely recognition of the standards.**
- **Although the EE Use Referential Plan set a clear goal for industry sector, action plan must be prepared and appropriate financial and human resources should be arranged in order to achieve the goals.**

Energy Efficiency in Peru

Major findings

Electricity

- **Access to electricity has increased from 45% in 1990 to 80% in 2009, and with a goal to reach 85% in 2012.**
- **As part of the EE Use Referential Plan 2009-2019, MINEM has identified potential sectoral electrical energy demand reduction of 10.7% by 2018.**
- **MINEM has put in place plan to expand Peru Renewable Energy Sources (solar, wind and micro-hydro).**

Residential and Commercial

- **The Government of Peru has recognized the energy efficiency potential in RC&P sector and has determined its highest priority as stated in the Law for the Efficient Use of Energy.**
- **Important actions have been implemented as the development of EE labelling for household appliances.**
- **Four project for energy saving goals from Referential Plan are: modernisation of lighting, improving energy-use habits, solar water heaters, and improved wood stoves.**

Energy Efficiency in Peru

Major findings

Transportation

- The use of natural gas for public transportation is one of the most important initiatives that Peruvian government has implemented.
- The starting operations of the “Metroplitano” under the Bus Rapid Transit (BRT) scheme was in mid 2010.
- In June 2009 the Ministry of Transport and Communications announced a bidding for the expansion of “Tren Eléctrico” (subway) to finalize the first phase of construction in June 2011.

Appliances and Equipment

- Since 1996, Peru has developed 42 standards; 29 of then are referred to EE.
- Peru has designed and implemented strong campaigns aimed towards the rational use of energy in residential and education
- The requirement of MEPS was confirmed with thw Supreme Decree No. 053-2007-EM of 23 October 2007.

Energy Efficiency in Peru

Major findings

Education and Energy Efficiency Related R&D

- **Peru published the Law of Science and Technology No. 28303 and Supreme Decree No. 082-2005-PCM**
- **Peruvian government has international cooperation for financing and innovation in R&TD projects.**
- **The economic support for Science, Research and Development through loans funding and national budget is very low.**

Recommendations

The Review Team made 51 recommendations in its draft final report.

Institutional Context

1. The Government of Peru should constantly and consistently show leadership for policy-making and policy-coordination.
2. The Government of Peru should provide a proposed autonomous energy efficiency centre with a clear and strong mandate (e.g. a mandate to encourage effective implementation and evaluation of energy efficiency improvement programmes in all sectors, a mandate to compile and analyse relevant energy end-use data and to provide advice to the MINEM and other relevant Ministries on the development of energy efficiency policy/programmes). The Government of Peru should also provide this proposed autonomous centre with stable and sufficient resources to implement effective long-term energy efficiency improvement programmes.

Recommendations

Energy Efficiency Goals, Targets and Strategies

3. **Integrate energy efficiency plans and policies across the General Directorate of Energy Efficiency (DGEE).**
4. **Create a Government Energy Management Program to integrate energy efficiency plans and policies across all Ministries.**
5. **Develop and Implement a National Action Plan for Energy Efficiency.**
6. **Create a pathway with annual timelines to meet the stated energy efficiency targets.**
7. **Set up a process for annual reviews of the energy efficiency target in the Referential Plan and include all sectors as part of the plan to increase the target over time.**
8. **Create a national public education and awareness campaign for energy efficiency. Tie in important national overarching goals in the message.**

Recommendations

Energy Efficiency Goals, Targets and Strategies

9. Create an energy efficiency framework that is focused on the low-income people of Peru.

10. Create an energy efficiency educational program for the school children of Peru (K-12 and university).

11. Create an economic environment for utilities to provide energy efficiency services to the people and businesses of Peru.

12. Create a parallel agency to PROINVERSION to finance only energy efficiency projects in all sectors.

Recommendations

Energy Data Collection and Monitoring

13. **Develop a set of energy efficiency indicators for economic sectors and sub-sectors.**
14. **Define the data needs, energy data, economic data, according to the energy efficiency indicators needs.**
15. **Create a legal mechanism to empower the government to obtain energy end-use data from all energy users in the economy as well as to spread the burden of data collection among the government agencies.**
16. **Carry out factorisation or indexation techniques on the indicators to remove the non-energy factors as well as to create economy-wide indicators by aggregation.**
17. **Develop an analytical energy efficiency monitoring framework. The analytical framework should help to be a communication tool for policy makers and energy users in the efforts to improve energy efficiency.**
18. **Publish, periodically, energy efficiency monitoring reports and disseminate the reports to stakeholders.**

Recommendations

Industry Sector

19. The Peruvian Government should develop a comprehensive National Action Plan of Energy Efficiency in order to show the pathway to achieve energy efficiency target in industry sector and to provide common understanding among stakeholders what to be done and when to be done.
20. It is recommended to develop energy efficiency comprehensive strategies to industry sector in Peru through mandatory and voluntary measures.
21. The MINEM need to establish stable and secured funding source and mechanism, as well as to consider establish a special purpose fund which may be called “Energy Conservation Promotion Fund” to move the Action Plan forward. MINEM should also look for external funding sources and from private or public investment fund to mobilize some capital for energy efficiency project. It is therefore suggested that public fund (Energy Conservation Fund) should be used to initiate and leverage private sector’s investment.

Recommendations

Industry Sector

22. In the light of the establishment of General Directorate of Energy Efficiency and the new Energy Efficiency Centre, strategic positioning and clear responsibilities must be assigned. It is recommended that the recently created both DGEE and EE Centre, the DGEE should take the role of policy maker while EE Centre takes the responsibility of implementing agency. Also, is highly recommended that capacity building in both organizations is extremely vital.

Recommendations

Electricity Sector

23. It is recommended that further effort is made to reduce the T&D losses and at the same to improve the thermal power plant efficiency. Audit and assessment can be conducted to identify the existing power plant efficiency and areas for improvement.

24. It is recommended that the Peruvian Government to institutionalise the legal framework within the electricity market and delivery sector.

25. There is opportunity to translate the proposed demand reduction to real action plan with active involvement from OSINEGMIN/COES/transmission-distribution operator/customers through the followings:

- **Utility should also play their roles to promote and encourage Energy Efficiency**
- **Rebates and incentives to customers implementing EE projects and utilising efficient equipment**
- **Establish funding mechanism for to support EE programs and initiatives**

Recommendations

Electricity Sector

26. It is recommended that proper planning for DG and RE interconnection together with rural electrification projects to ensure optimises asset utilisation, network expansion and reinforcement thus minimising network losses. This can also be linked to other initiatives towards achieving supply and load controllability, energy efficiency and Smart Grid.

27. It is recommended that the regulator enforces the requirement to have EE managers for certain type and size of electricity consumers. Thus it is necessary to have in place a national program to develop the required competent people in EE.

Recommendations

Commercial and Residential Sector

28. It is recommended to conduct detailed studies on energy efficiency status in order to obtain indicators of the efficient use of energy of each economy's sector.
29. It is highly recommended to improve the energy efficiency campaign programs, incorporate energy efficiency subjects in education materials and provide effective training related to technical, financial and economic fields.
30. The Peruvian government should implement monitoring and evaluation of policies in order to establish the steps towards the next stage as well as to provide an indicator of the efficiency benchmarking.
31. It is recommended to delegating tasks and authority of the ministries concerned.
32. It is necessary to develop and implement mandatory energy efficiency standards and seek for its international harmonization.

Recommendations

Commercial and Residential Sector

33. Competence development of energy managers and energy auditors.

34. It is highly recommended to develop minimum energy performance standards as a priority action in the commercial and residential sector.

35. Create efficiency program for low-income communities.

Recommendations

Transportation Sector

36. It is recommended that Ministry of Energy and Mines through DGEE and the Ministry of Transport and Communications should work together to develop medium and long-term planning programs.

37. The Government of Peru should develop a roadmap for the introduction of new transport technologies such as HYBRID cars as one of the alternatives to reduce the future high dependency of natural gas in the sector.

38. The MINEM, MET, MTC and MINAM should develop and implement programmes with National and International Banks in order to promote the financing of new vehicles (for mass transportation such as taxis and freights) at local and regional level for lower income drivers.

Recommendations

Transportation Sector

39. Government should regulate the transport (taxis and freight drivers) in order to achieve best energy efficiency practices and incentives for car drivers.

40. To follow-up on the construction of public transport as "Metropolitano" under the Bus Rapid Transit (BRT) scheme, the electric transport of the Electric Train Lima (Metro) and others and provide more information to final users about their benefits and advantages.

Recommendations

Appliances and Equipment

41. MEPS should be based on energy performance of shipped products in the Peruvian domestic stock (international references shall be established on a particular energy performance that is not native to Peru). We strongly recommend that Universities or Research Institutes support to establish technical level of MEPS, these levels should consensus with all stakeholders.

42. The government of Peru should seek legal mechanisms necessary to ensure that, at the same time to comply with its constitution, to establish mandatory energy efficiency standards basing on the environmental benefits involved in their implementation.

43. Peru should be supported by universities or laboratories to perform studies with measurements, surveys and statistical data to determine, where efforts should be concentrated; it is required to achieve the set goals. Efforts in Peru should be centralized, it is necessary that all efforts and past experiences to focus on the newly established office to have a starting point and new goals.

Recommendations

Appliances and Equipment

44. The international experience indicate that mandatory standardization programmes encourages market transformation, for example, the impact of mandatory standards programme on the Mexican electricity system has been significant; in terms of capacity, it has reduced the need for total generating capacity of 3440 MW, or 6.4% of capacity installed by 2005.

45. Peru could determine the mechanisms for standard monitoring compliance and therefore should implement an infrastructure (laboratories network) for compliance verification and monitoring and surveillance to verify compliance with the standards.

46. The energy saving campaigns should be addressed to recommend better energy-use habits for major energy-consuming equipment as was done in 1995. These campaigns should be permanent to encourage a savings culture, despite people tend to forget that these campaigns have become habits and habits form a culture.

Recommendations

Energy Efficiency Related Research and Development

47. It is highly recommended that CONCYTEC should be an independent organisation, separate from the Ministry of Education, in order to have better management autonomy and provide institutional strengths.

48. The International Cooperation Programmes should be strengthened in order to achieve more financing and investment to R&D programmes with high priority in Universities and Research Centres.

49. The Peruvian Government should increase its gross domestic expenditure in Science Research and Technology Development.

Recommendations

Energy Efficiency Related Research and Development

50. It is highly recommended to establish National Institutes in areas such as Hydrocarbons (e.g. Petroleum and Natural Gas) and Electricity/Renewable Energy in order to strengthen research and development in specific areas with the formation of Postgraduate professionals with Master and Ph.D. degrees.

51. It is recommended to establish a National Researchers System (Sistema Nacional de Investigadores) to be dependent from CONCYTEC in order to incentivize high quality professionals and reduce the "brain-drain" from Peru.

Summary

- Peruvian government, through the Ministry of Energy and Mines (MINEM), has a strong commitment to Efficient Use of Energy through the development of Energy Efficiency Referential Plan 2009-2018.
- New structural changes to encourage Energy Efficiency policies and implementation projects through the creation of Directorate General of Energy Efficiency (DGEE).
- Proposal for long-term Energy Policies are under development (Proposed National Energy Policy 2010-2040).

Summary

Summary

Thank you for your attention

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