



An Energy Efficiency Roadmap for the Philippines 2014-30



Switch Asia Policy Support Component in the Philippines

An Energy Efficiency Roadmap for the Philippines 2014-30

Final Report

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EXECUTIVE SUMMARY

While the Philippines has established a great deal of programmatic activity to advance energy efficiency since 2004, the Department of Energy has identified the need for stronger overarching objectives in order to guide its energy efficiency program development. Over the last decade there have been numerous statements of energy efficiency strategy and direction by Government; while these statements have been largely consistent with each other, they have not been sustained, specific enough nor substantially targeted to guide long-term program development.

At the request of the Department of Energy, the Roadmap development process commenced with a review of the energy demand context of the Philippines and its current energy efficiency programs, which was completed by EU-Switch Asia Policy Support Component in November 2013. This review considered the effectiveness of current programs, and identified gaps and unrealized opportunities that may be available by sector, as well as potential savings by sector based on international experience of successful energy efficiency implementation. These potential savings estimations form the basis for the setting of energy efficiency targets for the Philippines that are reasonable, defensible and based on a robust data and methodology.

The Roadmap draws on this review exercise to integrate new identified opportunities and proposed priorities with existing energy efficiency strategies and plans, to present a consolidated statement of energy efficiency strategy for the Philippines Government for the period 2014-30. Key components of the Roadmap include introductory statements of overall vision; clear objectives and measurable targets; short, medium and long term potential actions, both cross-cutting and by sector; and plans for measuring and monitoring progress. The balance of this document sets out the background to the integration process and the proposed potential actions in detail, while the roadmap overall is summarized on a single page at page 20.

Government has a number of levers at its disposal to put the Roadmap into practice. Some discussion is provided on *how* the Roadmap may be put into practice, as well as for *what* it will aim; this includes discussion of the enablers of energy efficiency, such as policy and regulation, finance, institutions, and markets and pricing. By judicious use of these levers towards the Roadmap's objectives, it is intended that the Philippines Government will be able to position itself to realize the available energy efficiency potential.

The Roadmap also places a measure of importance on the development of activities in data collection and monitoring and evaluation, which has been limited in the Government's energy efficiency activities to date. This is a substantial aspect of future work envisaged under the proposed programs of action.

The next steps for developing this Roadmap into a useful guide to program implementation will involve translating the Roadmap into a series of sector-based action plans, that will detail the approach to implementing Roadmap components, including allocating roles and responsibilities and financial resources. A separate action plan is also proposed to provide the further required detail to take forward the data collection, monitoring and evaluation for the Roadmap and its intended outcomes.

1 BACKGROUND TO ROADMAP DEVELOPMENT

1.1 Introduction and Process

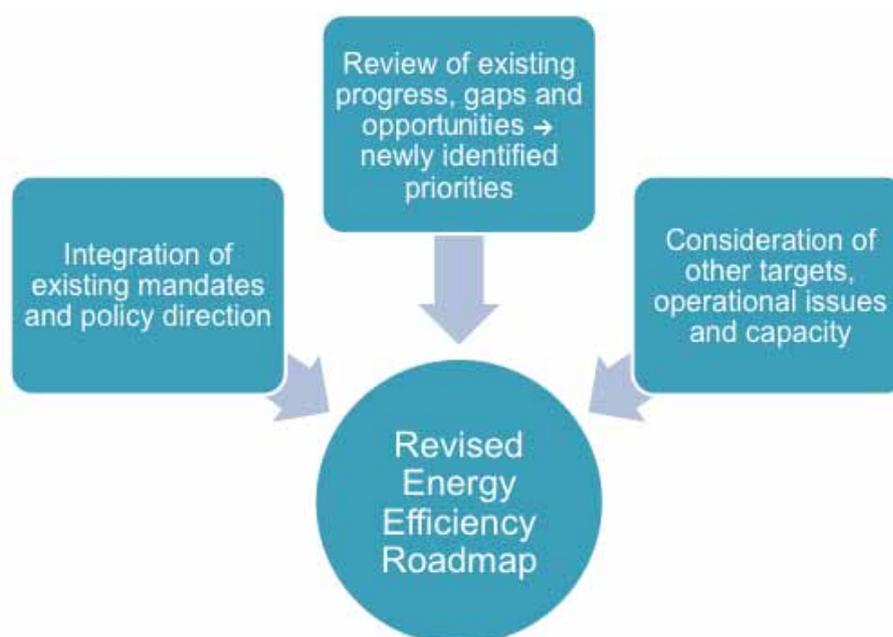
The creation of an Energy Efficiency Roadmap for the Philippines 2014-30 is the first plank in a detailed outline of the actions required to create a more energy-efficient Philippines across all sectors of economic activity. The 'roadmap' terminology is simply a euphemism for a long-term strategic plan; there is no single directly applicable template for DoE to produce such a roadmap, though many roadmap templates exist, for business strategy, technology or policy¹.

As a starting point for developing a future-looking statement of priority activities in energy efficiency, a recent review was completed considering current implementation progress, targets, and future opportunities. In broad terms the proposed process to develop a roadmap involves:

- Starting from existing long-term plans and targets, adjusting for developments since those plans were made;
- Integrating current activity with new opportunities, in light of the recent review: this includes discussion of the justification for targets with some reference to the Philippine energy context, integration of existing and new actions, and enablers and options for reaching them;
- Set out new targets and recommended actions by sector, and creating actionable, measurable milestones for the short, medium and long term.

A graphical representation of this integration process is provided in Figure 1.

Figure 1: Roadmap Development Process



¹ For examples, see the IEA's Technology Roadmaps, or the EU *Roadmap for moving to a competitive low carbon economy in 2050*.

Drawing on this experience, the Roadmap must include a number of key components:

- Introductory statements of overall vision, clear objectives and measurable targets;
- Short, medium and long term potential actions, both cross-cutting and by sector;
- Plans for measuring and monitoring progress.

Beyond an initial articulation of milestones to be achieved, the Roadmap can only include a limited amount of detail on how these milestones may be reached; the Roadmap addresses energy efficiency actions in all sectors and at different time frames, each of which may require a series of concerted actions working in parallel. As a next step, it will be important to develop sectoral action plans to provide this greater detail on the recommended pathways to implementation, once there is broad consensus on the Roadmap's objectives and actions.

1.2 Existing energy efficiency policy directions, targets and objectives

Existing vision and targets

The existing NEECP sets out the long-term statement of vision for energy efficiency in the Philippines; namely to make energy efficiency and conservation “a way of life” for Filipinos. Further, EECD states its vision as “an energy efficient nation that contributes in achieving the country’s economic development and help ensure energy security, optimal energy pricing and sustainable energy systems.” There is no apparent reason why these statements of vision should no longer be appropriate for a revised Roadmap.

NEECP also sets out the aim to reduce the final Energy Demand of the country by 10% annually from 2011 to 2030. Within this period, the government is expected to obtain an energy savings of 69,100 KTOE (3,455 KTOE/year), a deferred capacity of 6,780 MWe (339 MWe/year), and an emission reduction of 178,980 kT (8,949 kT/year).

These targets need re-calibration for consistency, as there are a number of potential interpretation issues. In particular:

- Setting an annual energy demand reduction target of 10% creates confusion as to whether demand should be reduced 10% from the baseline each year, or to reach this level cumulatively by the end of the period (which was the initial intention).
- Setting out expected energy savings and greenhouse gas reductions does not recognize potential exogenous changes in demand (e.g. through weather-related demand disruptions), nor changes in the greenhouse intensity of energy generation or the fuel mix (e.g. through new cleaner generation coming on line).
- Comparison with regional (ASEAN) and other targets demands consistent methodology for measurement.
- Sectoral targets need to be articulated as well as overall goals.

For these reasons, it is appropriate to recast targets in terms of sectoral and overall savings potential measured by energy intensity. While expression in terms of energy intensity provides for consistency and elimination of confusion, for measurement and evaluation purposes, further work is still required to provide reliable estimates of economic growth by sector and to separate structural economy effects of changing economic composition from actual impacts of energy efficiency programs. This is addressed below as part of the monitoring and evaluation processes that need to be instigated in putting this Roadmap into practice.

Existing priority actions – key expressions of commitment and strategy

Since 1975 the Philippine Government has made a wide range of statements of strategic intent regarding energy efficiency. These both build on and augment the mandates given to the Department of Energy and other bodies to pursue energy efficiency activities. These statements, along with the Republic Act 7638 which set out the basis for formation of the Department of Energy, contain a number of required activities for the Department that still guide program development today, though the statements tend to operate at different levels².

In more recent times, the 2008 Philippine Energy Summit discussion on Energy Efficiency and Conservation resulted in the drafting of several major priority action plans, for DoE to consider for implementation after the summit. This was re-expressed in articulating the Energy Reform Agenda of the current administration, and added to in EECD's Strategic Planning Workshops that have further crafted the Division's Work and Financial Plan and its mission, vision and values. Additionally, various presentations and public statements by DoE in 2012 and 2013 have again communicated a slightly revised expression the current priorities and strategy to further energy efficiency implementation.

These various recent statements of intent are summarized and presented in Table 1 below as an indication of Government's current energy efficiency thinking. Statements of priority action made in the majority of these contexts are highlighted in red, and therefore represent relatively consistent statements of energy efficiency policy priority since 2008. Statements made in around half of these contexts are highlighted in orange, reflecting their likely status within DoE as lesser priorities.

² On the one hand, RA7638 and other instruments contain high level DoE edicts with limited operational guidance, for example, 'to monitor sectoral energy consumption and conduct energy audits, technical training, energy management advisory services, and technology application on efficient energy utilization'; or 'to develop and implement a continuing energy conservation program designed to optimize energy utilization, including a nationwide information campaign on energy conservation'. On the other hand, presidential decrees, executive orders, administrative orders and department circulars related to energy efficiency are at times very specific on e.g. requirements for roadside billboards or exemption of certain vehicle categories from import requirements.

Table 1: Existing Statements of Philippine Government Strategies and Priorities for Energy Efficiency Implementation

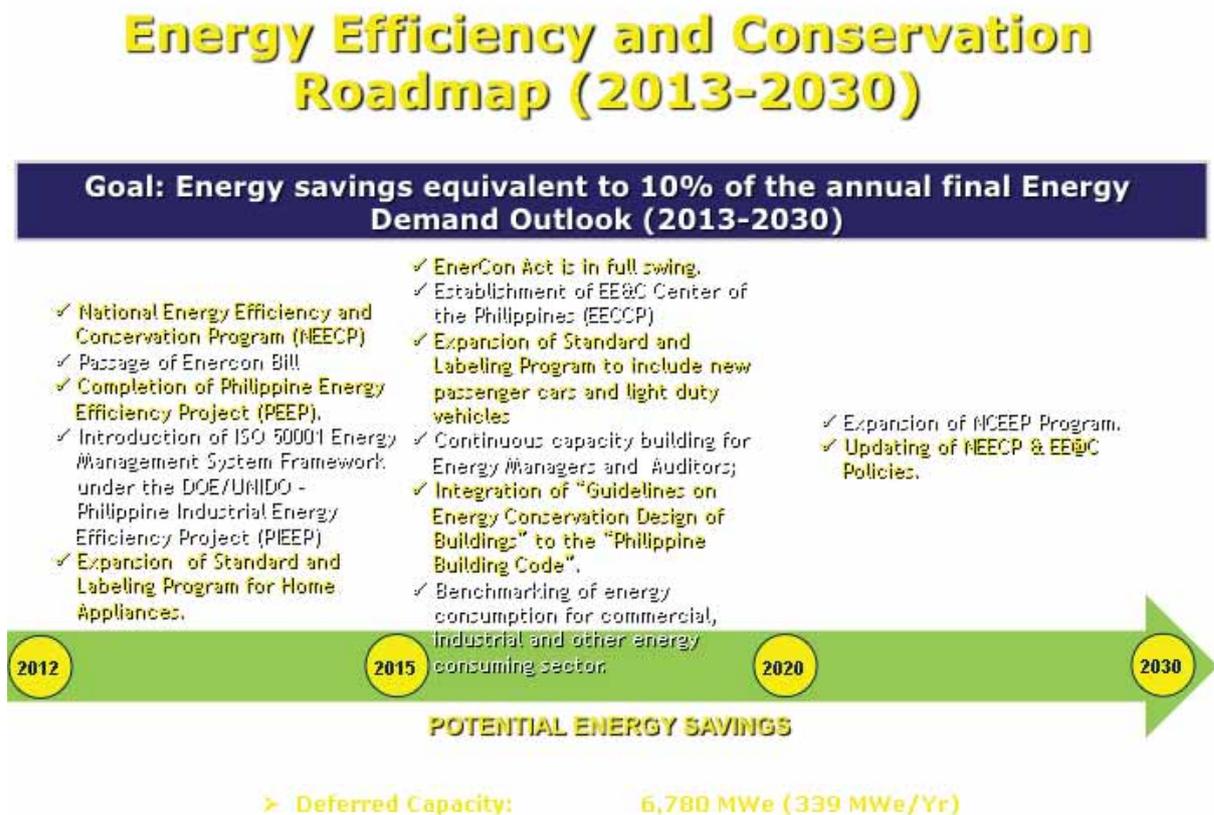
Current statements of strategic objectives and priorities	Reference points for expression of strategy	Key mechanisms in place and other comments
<u>Immediate/Short Term</u>		
The establishment of a legal policy framework for energy efficiency in the supply and demand side of the energy market sector	PES	Linked directly to the passage of the Enercon Bill.
Re-file/finalization of the Energy Conservation Bill	ERA, EECDSP, RPDM	
Expand reportorial requirements for the industrial, commercial and transport sectors to include establishments consuming more than 500,000 liters of oil equivalent annually	EECDSP	
Develop energy benchmark for the commercial and government buildings and the manufacturing industry sectors	PES, EECDSP, RPDM, ERA	
Development/update of Energy Efficiency Standard & Labeling for greenhouse gas (GHG) contributors, particularly fuel mileage rating for new vehicles	PES, EECDSP, RPDM, ERA	DTI-BPS and appliance manufacturers and associations will play a key role
Enhance Standard and Labeling program through product testing and research of the DOE's lighting and appliance testing laboratory and to consider accreditation of private testing laboratories and to encourage private sectors/entities participation to move investment in this new business industry area.	EECDSP	
Promote and strengthen private ESCOs as a new business market industry model	RPDM, ERA	Not specific on how promotion and strengthening should occur, however intent is noted
The development of a national strategy for efficiency improvement in power generation, transmission and distribution	PES, EECDSP	Also restated as part of medium-term objectives (refer below)
Promote and establish an accreditation/ certification system for energy auditors and energy managers	EECDSP, RPDM	PIEEP is the key reference point and needs to be better integrated into an overall capacity building program
Promote adoption of Energy Management Standard in industries under ISO 50001 framework	ERA, RPDM	
Continue implementing NEECP components (IEC, GEMP, PEEP, PIEEP)	EECDSP, RPDM	Not a specific statement of strategic intent
Conduct energy audit of DOE-attached agencies	ERA	
Promote energy efficiency lighting technologies (Philippine Energy Efficiency Project)	ERA	
Continue implementation of foreign assisted projects – JICA and PIEEP	RPDM	
The creation of comprehensive and innovative financial facilities e.g. loan guarantees, EE&C fund	PES	Unclear where such funding would be derived
Major retrofit program for Commercial and Industrial Sector	PES	This can be facilitated through ESCO sector capacity building
Massive replacement of incandescent bulbs to compact fluorescent lamps (CFL) in Distribution Utilities	PES	
Rationalize public utility vehicles in major roads, particularly EDSA	ERA	
Review and amendment of the Procurement Law/Guidelines for Energy Efficiency related procurement	PES	
Creation of an Energy Efficiency & Conservation Center (EECC)	PES	

Current statements of strategic objectives and priorities	Reference points for expression of strategy	Key mechanisms in place and other comments
Provision for the implementation of Public Transport Leasing Program	PES	Not clear how this initiates energy efficiency per se
Provision for the implementation of an Aviation Fuel Efficiency Enhancement Program	PES	
Development of EEC Guidelines for residential buildings	RPDM	
<u>Medium Term</u>		
Expand promotion of the Energy Efficiency and Conservation Program and Energy Consumption Monitoring in large seaborne vessels such as passenger and cargo ships; power generation plants; and power distribution utilities.	PES, RPDM, ERA	While this is stated regularly as a priority, road transport remains the short- and medium-term focus of energy use in transport
Intensify promotion of heat rate improvement in power plants	EECDSP, ERA	This is linked to the short-term objective of development of a national strategy for efficiency improvement in power generation, transmission and distribution
Promote green building rating system through energy efficiency concepts and the development of appropriate policy framework	EECDSP, ERA	Statement is not specific however intent is noted
The reinstatement of Demand-Side-Management (DSM) practices among Distribution Utilities	PES, ERA	This is linked to the short-term objective of development of a national strategy for efficiency improvement in power generation, transmission and distribution
Extension of Energy Efficiency Lighting in Local Government Buildings and Roadways; and	PES	
Provision for the implementation of Public Transport Reform for Mass Transit	PES	
Develop web-based energy consumption database monitoring system to monitor energy consumption and annual energy conservation programs of all demand sectors consuming more than 500,000 liters of oil equivalent annually or 2 million Kwh of electricity and these include industrial, commercial, government buildings, power, transport and Medium size Enterprises (MEs) sectors	EECDSP	Linked directly to passage of the Enercon Bill
<u>Long Term</u>		
Redesigning or introduction of new interventions Expansion of NEECP program	PES RPDM	Not a specific statement of strategic intent
Monitoring compliance of the action plans	PES	To be retained and emphasized in the short term
Scaling up of effective action plans	PES	Not a specific statement of strategic intent
Expand existing policies on energy efficiency and conservation	RPDM	Not a specific statement of strategic intent

Key:
PES = Philippine Energy Summit 2008; ERA = Energy Reform Agenda 2011; EECDSP = EECD strategic planning 2011-12; RPDM = Recent presentations to the public by DoE management 2013 (e.g. [http://www.doe.gov.ph/doe_files/pdf/01_Energy_Situationer/2012%20PEP%20IEC%20\(EE&C\)%20REV.pdf](http://www.doe.gov.ph/doe_files/pdf/01_Energy_Situationer/2012%20PEP%20IEC%20(EE&C)%20REV.pdf) and http://www.eefphilippines.com/program_cebu.php?detail=1&rec_id=28)

In terms of summaries for this series of priority statements, the most detailed and recent publicly available presentation of the summary of Roadmap measures is from 16 July 2013 as in Figure 2 below. This articulation of strategy captures some but not all of these statements of intent, and it also introduces a priority to include energy efficiency measures in the Philippine Building Code that was not previously identified.

Figure 2: Existing Energy Efficiency Roadmap for the Philippines



A few observations on this most recent Roadmap are:

- Many priorities are largely reiterations that current activities and programs are expected to continue, rather than a statement of clear future strategic direction.
- The need for better coordination and orchestration of planned energy efficiency activities is clear; some of the activities overlap each other, while some have been missed.
- There is a need for sectoral differentiation to better map activities in different sectors, including a cross-sectoral track that can consider priority actions that are foundational in nature, or that relate to overall program management.
- There is a need to re-calibrate intended programs with potential impacts established by the evidence of recent reviews. In other words, priorities need to emphasize those areas that are large users of energy in the Philippines and where energy savings are expected to be available at least cost.
- The need for monitoring progress along with providing for the data collection requirements that are implied, which currently does not receive any focus.

1.3 Newly identified opportunities and priority actions

In creation of a revised energy efficiency Roadmap, stated priorities and existing activities must be placed in the context of emerging trends in Philippine energy use; what is known about future energy efficiency potential by sector; the policy levers that have been proven available and effective in other jurisdictions; and existing Departmental capacity to deliver building on existing program successes.

A recent policy review (November 2013) attempted to provide this context with a view to creation of the Roadmap, and forms a sister document to this paper. The review set out a revised list of potential energy efficiency priorities by sector, as appended in Annex 2. All of these recommendations are based on a reading of the most beneficial strategies in light of the factors outlined above.

If accepted by DoE, these recommendations must now be re-cast as actionable priorities, that take into account existing initiatives and current activities, gaps and future opportunities, as well as other considerations on implementation as outlined in Part 1.4.

1.4 Other considerations to be integrated into the creation of a refined Roadmap

The enabling environment – how targets and milestones will be achieved

In recommending a range of realistic and actionable priorities that may be included in a long-term energy-efficiency roadmap, guidance is required not only on the kinds of activities that will deliver the objectives, but *how* they can be put into practice, and the levers available to Government in implementing them. It is difficult to be definitive about methods of implementation given the diversity of issues and stages of readiness across different sectors; this needs to be the subject of future, sector-specific work to create action plans for implementation (as flagged in Part 1.1).

To provide at least a starting point for development of these action plans, a broad classification of key enablers which will be important reference points for the implementation phase are depicted in Figure 3. Implementation enablers straddle:

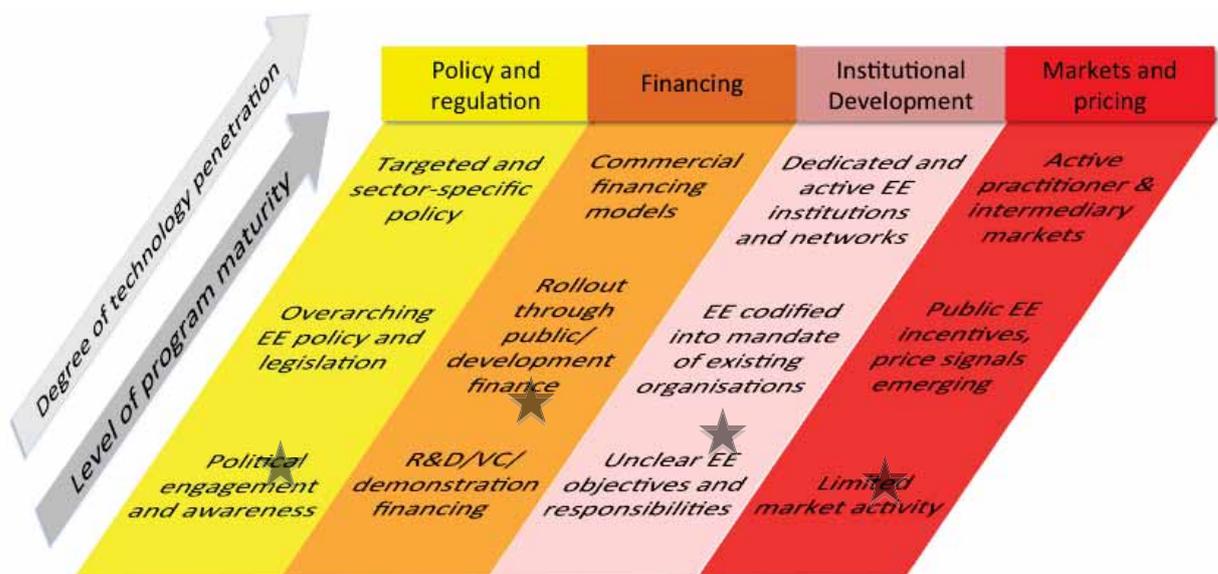
- *Policy and regulation* – largely this is through strengthening existing policy, advocacy, programs and regulations. Key developments are already underway, through proposed legislation which aims to strengthen the impact of regulation, and better targeting of sectoral policy.
- *Financing* – increasingly, energy efficiency implementation will not be able to rely on public budgets and donor funding sources and will need to harness private sector and other partner finance as part of the overall implementation strategy. Program funding to date has relied to some extent on development organizations, such as through ADB's Philippine Energy Efficiency Project, UNIDO's Philippine Industrial Energy Efficiency Project and the World Bank's Chiller Replacement program, however increasing commercial finance involvement will be a key enabler of scaled-up activity. Some of this commercial finance facilitation is underway at the moment through, for example, IFC's financing program that engages through local commercial intermediaries. More needs to be done to increase private sector financing capabilities and de-risk the ESCO sector.
- *Institutional Development* – clear organizational mandates and roles and responsibilities will assist in progressing the implementation agenda. Along with defined responsibilities, the collection of data and articulation of monitoring and reporting requirements is another means by which implementation will be strengthened.

- *Markets and pricing* – alignment of economic signals with desired outcomes, including elimination of subsidies and cross-subsidies, or the creation of pricing incentives, sends clear signals to provide incentives for energy efficiency. This in turn forms the basis for development of business models and new entrants focused on delivery of energy efficiency to support national goals and objectives.

Overlaying all of this is the Philippines’ ability to promote and catalyze uptake of energy efficiency technologies, as the program progresses. While the country is more of a product taker in regard to technologies and is not a major manufacturer of energy using equipment, it is expected that systematic improvement of the enabling environment, as above, would lead to an increased penetration of innovative and new energy efficiency technologies, in turn increasing the possibility for further energy efficiency gains.

An estimation of the Philippines’ current position on these four spectra is depicted with a black star, for discussion. This helps to understand, further situate and describe the appropriate actions that may need to be taken to give effect to each strategy, within the bounds of available capacity and resources.

Figure 3: Key Energy Efficiency Enablers



It is also important to have reference to the capacity and authority of DoE and other implementing agencies to deliver the outcomes in practice. In some cases, principal implementation responsibility for achieving targets will lie with other Government agencies, or also may rely on the actions of private companies and financiers. While DoE’s incomplete control over the wide range of energy efficiency outcomes is acknowledged, it is incumbent on DoE to create better coordination and engagement mechanisms both inside and outside government to ensure alignment of key activities that may impact the achievement of overall energy efficiency objectives.

Other reference statements of energy efficiency objectives

Other than the recently completed review of policy and implementation progress, there are a number of other touchstones in regard to setting longer-term strategic directions for energy efficiency in the Philippines. Chief among these are:

- APEC and ASEAN-wide targets - the 2007 APEC Leader's Declaration aims to work towards achieving an APEC-wide aspirational goal of energy intensity reduction of at least 25% by 2030 (based on 2005 levels), and any national targets for the Philippines will be viewed in the context of that benchmark. Further, the recently completed APEC Peer Review made a large number of recommendations that can be considered in this Roadmap.
- In October 2013 the International Energy Agency released a series of recommendations on how to unlock energy efficiency in Southeast Asia.

Annex 1 contains these recommendations and targets in detail. It is prudent to situate any Roadmap objectives in the context of these recommendations.

Additionally, the Roadmap must aim for alignment with Government's other cross-sectoral and long-term planning and strategy documents that have relevance to energy efficiency, including numerous transport strategies, industry strategies, the Philippine Development Plan and National Climate Change Action Plan, while still acknowledging the differing emphasis of each of these plans.

2 A PHILIPPINES ENERGY EFFICIENCY ROADMAP, 2014-2030

2.1 Statements of overall vision, objectives and targets

Vision

This Roadmap guides the Philippines in building an energy-efficient nation, and in making energy efficiency and conservation a way of life for all Filipinos. Energy efficiency will advance the country's economic development and help ensure energy security, optimal energy pricing and sustainable energy systems.

Targets

Targets are set in the context of strong economic growth and energy demand growth expected during the period. Demand is forecast to grow by 78% between 2014 and 2030, an average annual growth rate of 3.5%; transport and industry are the dominant end use sectors.

Targets are based on an assessment of achievable potential, grounded in international experience and knowledge of existing levels of efficiency in the country³.

To eliminate exogenous causes of variation in energy demand, and to align with internationally accepted energy efficiency benchmarks, it is proposed that economy-wide targets are consistently denoted in terms of percentage improvements in energy intensity (units of energy input per unit of GDP output). This should be measured at a constant economic structure⁴.

Table 2: Philippine Energy Efficiency Targets to 2030

Sector	Implied annual % savings (total savings by 2030)	Annual energy saved by 2030 (KTOE)
Transport	1.9% (25%)	4,861
Industry	1.3% (15%)	3,088
Residential Buildings	1.2% (20%)	1,432
Commercial Buildings	1.9% (25%)	1,206
Agriculture*	0.8% (10%)	78
Total	1.6% (24%)	10,665
Economy-wide improvement in energy intensity	3%	

* This level of efficiency improvement is assumed through endogenous technology advancement; no initiatives are proposed for the agricultural sector given its small percentage share of national energy use.

³ Methodologies and justifications for the chosen sector target levels are provided in detail as part of the sister document to this Roadmap, *Review of Philippines Energy Efficiency Policy and the National Energy Efficiency and Conservation Program: Progress, Targets, and Future Opportunities*, December 2013, and beyond that evidence base target levels reflects the author's own considered judgment.

⁴ Further analytical work is required to determine a basis for measuring changes in energy use due to shifting economic composition separate from the impacts of energy efficiency programs (Refer Part 2.3).

2.2 Short, medium and long-term actions

Short Term (2014-15)

Transport Sector

- *Closer support to manage identified risks in vehicle conversion and e-vehicle/e-trike programs* – existing funded initiatives target key energy use sectors in transport such as tri-cycle and taxi fleets. However, implementation is at risk due to reliance on relatively unproven business models, which need close attention to ensure success.
- *Fuel Efficiency Standards developed for light-duty vehicles, vans/jeepneys, tricycles and heavy vehicles (trucks)* – a long-stated objective, this could be a very effective mechanism for increasing the efficiency of vehicles in a given category, though its impact through new vehicles could take time.
- *Re-formulated coordination mechanisms with other agencies* – reinstating talks and coordination bodies with BTI-DTS, DOTC and other agencies regarding road transport fuel efficiency will be important to implementation and to creating of alignment with overall energy efficiency goals.

Industrial Sector

- *Link existing training projects with ESCO capacity building* – at present the PIEEP and AEMAS training programmes are focused on training individual energy managers. DoE can play a role in ensuring that training programs are coordinated and that these informed individuals can also develop into service delivery firms, and have their capacity built as such, which will be essential to further scaling up of energy efficiency activity.
- *Develop sectoral focus programs to facilitate EE in energy intensive industries (cement and construction, sugar)* – specific programs to design a suite of intervention options for energy intensive industries need to be developed. Sugar processing and cement/construction are suggested as first priorities. This could include specific expertise and advice for industry on motors and drives, or on efficient cement production through dry kiln processes, and facilitation of industry-specific retrofit project development and financing in order to create showcase industry projects.

Commercial Buildings Sector

- *Reformulate group to oversee EE measures in Building Code* – inclusion of EE measures in the national building code is a cornerstone policy for better performance of commercial buildings. In the short term, working group discussions need to be reinvigorated between Departments (especially DoE and DPWH) to achieve this aim, around the stated objective of benchmarking commercial building energy use information.
- *Retro-commissioning program for existing buildings* – this would involve supplementing existing training workshops and seminars (through e.g. UNIDO, AEMAS) with stronger information and guidance on building management systems, to ensure that available energy savings are realized without the need to allocate budget to building retrofit. Promotion of expertise on retro-commissioning could yield good savings from existing commercial buildings without the immediate need for refurbishment capital.
- *Benchmarking and ratings for building information and reporting* – while not saving energy directly, this benchmarking activity is foundational to future efforts to measure and monitor energy efficiency activity, and to specify thresholds for building performance in the Philippine Building Code. It is also a key contributor to processes such as the development of Nationally Appropriate Mitigation Actions (NAMAs) by the Climate Change Commission, which is considering the potential energy savings of the commercial building sector. A comprehensive green building ratings system has been established through the Philippine Green Building Council in 2012-13 and these ratings require ongoing pro-

motion to increase penetration, particularly in the area of operational building performance, which will provide valuable benchmarking information and act as a precursor to introduction of other commercial building information measures.

Residential Buildings Sector

- *Enforceable minimum energy standards for appliances, with a focus on space cooling and refrigeration* – Continuation of the successful standards and labeling approach with a focus on key energy-using appliances, and also on development of a strong monitoring, verification and enforcement regime (on which the EU-Switch Asia Policy Support Component plans to assist).
- *Building envelope measures* – along with ongoing rollout of lighting retrofit and efficiency programs that have been successful in the past such as under the Philippine Energy Efficiency Project (PEEP), a ‘cool roofs’ and insulation program in partnership with utilities could aim to redirect network expansion infrastructure spending to spending on household-level building material provision (insulation, roofing materials) to create improvements for better efficiency. It is noted that enforcement on such measures will be through LGUs, which may require further work to build implementation capacity.

Cross-Sectoral

- *Support passage of Enercon Bill* – the bill currently tabled in Congress, while not all-encompassing, sets out a number of crucial and enforceable measures to improve on data collection, information and consideration of larger scale energy efficiency opportunities. It also bestows authority on DoE to pursue energy efficiency action more concertedly with other agencies and organizations. For those reasons it is important that the Bill is championed and supported to be passed into law, rather than be allowed to languish.
- *Establish EE database, data collection regime and monitoring and evaluation framework* – this is a high priority piece of work that must happen regardless of the status of the Enercon Bill and its passage. While the Bill sets up a data collection mechanism for large energy users, a more comprehensive data collection framework is now required, as well as plans for how the data will be assembled and used to monitor progress towards energy efficiency targets. It will be essential for this effort to be adequately resourced as a key part of implementation budgets. More detail is included under ‘Measuring and Monitoring Progress’ below.
- *Establish enforcement regimes* – while the Philippines has established a range of efficiency standards for energy-using equipment and appliances, and plans to do so for vehicles and other equipment, it will be of increasing importance that compliance with the standards is enforced if projected efficiency gains are to be realized. Where standards are not regularly or consistently enforced, less scrupulous manufacturers and on-sellers can gain an unfair economic advantage over law-abiding competitors by falsely or improperly certifying the efficiency of their products. This is important in a highly price-sensitive end-user market such as the Philippines and not only distorts competition in the short-term, but undermines the kind of long-term competition that drives innovation. The EU Switch-Asia Policy Support Component is currently proposing a process to address enforcement for the Standards and Labeling program, while the Enercon Bill is also critical to establishment of enforcement regimes in that it sets up new responsibilities and legal requirements. However, efforts to improve enforcement regimes for mandated energy efficiency requirements must be ongoing and resourced appropriately.
- *Strengthen ESCO capacity* – the existing energy audit service provided by the Department of Energy tends to crowd out private ESCOs, and should be redirected instead towards strengthening the ESCO sector. A stronger energy services sector will unleash private sector financing for larger energy efficiency projects. Beyond its fledgling accreditation scheme the DoE must provide for greater ESCO sector support potentially in the form of market facilitation through standard legal contracts, guides to procurement of en-

ergy services, financial facilitation and assistance with establishing monitoring and verification regimes for projects.

- *Continue awareness-raising campaigns* – Government’s role in raising public awareness of energy efficiency benefits remains important and must continue, with an added emphasis on evaluating results of campaigns, and aiming for better understandings of consumer sentiment and energy culture.

Medium Term (2016-20)

Transport Sector

- *Financial incentives for EE through vehicle taxes* – a key means of enforcement of vehicle standards is through fiscal measures such as vehicle registration and other road taxes. Concessional payments/penalties can be linked to ownership of vehicles that meet or do not meet prescribed standards.
- *Promotion of key vehicle technologies* – overcoming the rolling resistance of tires and the operation of cooling and lighting systems can consume a significant proportion of transport fuel. While the Philippines is likely to remain a product taker in regard to vehicle technology, improved promotion and use of these non-engine vehicle components can be cost-effectively promoted to increase fuel efficiency.
- *Driver education and fleet management programs* – driver education programs and larger-scale fleet management for larger corporates, government and freight companies are also cost effective measures for improving fuel efficiency.

Industrial Sector

- *Develop energy standards for motors* – beyond the appliance sector, it is worth considering minimum performance standards for electric motors. Motors are the largest end-user of energy in the world, with over 40 million motors sold annually, accounting for nearly half of global electrical energy use (IEA, 2011). The applications for these motors cover almost every stage of manufacturing and processing, and also extend to commercial buildings and the domestic environment. Electric motors are used to drive pumps, fans, compressors, mixers, agitators, mills, conveyors, crushers, lifts, machine tools, cranes, household appliances, power tools, disk drives, etc. Standards development would need to be backed by an enforcement regime capable of ensuring uptake of efficient motors.
- *Facilitating example business models including ESCOs and finance* – as part of capacity building efforts for ESCOs, DoE can facilitate the execution and promotion of successful industrial case studies that demonstrate how energy services have been procured, and the financial model deployed.
- *Implement demand response programs* – many jurisdictions have had success in administering systems of financial incentive through which payments are offered to large energy users to reduce their energy load in times of peak demand. This payment is justified based on the otherwise sharp increase in spot electricity prices that would need to be paid if demand was to be fully serviced; in such a case it is cheaper for the utility to pay end users for reduced demand than it is to pay the wholesale price for the purchase of electricity. The Philippines has a sophisticated wholesale electricity market that would enable delivery of such programs.
- *Review of energy pricing models* – in the medium term, pricing structures may need to be examined; it is widely acknowledged that high electricity tariffs in the Philippines curtail the use of energy to some extent, however through further pricing and tariff structure reform it may also be possible to promote efficiency for large users more directly.

Commercial Buildings Sector

- *EE measures included in national Building Code* – a key priority for commercial buildings is the inclusion of efficiency measures in the national Building Code, based on the existing *Guidelines for Energy Conserving Designs of Buildings*. There are many international reference points for the successful inclusion of energy efficiency measures into building codes. This will need a strong enforcement regime in order to be effective.
- *Government demonstration retrofits to showcase ESCOs and financing models* – Through the Philippine Energy Efficiency Project, Government has achieved a measure of success with retrofit of lighting in its facilities. While this program was supported by donor funds, there is a clear opportunity to extend the program to a deeper retrofit of government buildings through accessing finance through the ESCO sector. Using government's procurement power in this way would bolster its support for the ESCO industry while also achieving the parallel aim of energy savings within Government buildings. Given that lighting retrofits have already been carried out, it may be appropriate to focus on air-conditioning given that most government offices still retain older air-conditioning equipment; other possibilities include cogeneration and tri-generation demonstration products.
- *Promote green building ratings* – good early work has been completed to develop consistent ratings for commercial buildings. The penetration of these ratings needs to be scaled up with a focus on operational performance in order to pave the way for more robust information requirements to be imposed upon commercial buildings in the longer term.

Residential Buildings Sector

- *Develop role of utilities as key implementation partners and information providers* – electric utilities and fuel providers are uniquely placed at the customer interface and can play an important role in information provision and energy efficiency awareness. Experience in other countries and from literature suggests that provision of energy usage information and targeted advice is a cost effective way to achieve a sustained 1.5-3.5% reduction in energy use⁵.
- *Specific EE programs for low-income households* – consideration can be given to the types of measures that may be best picked up by low income households, in an effort to ensure relevance to the majority of the residential sector, and as a way of integrating the energy efficiency and poverty reduction objectives of government.

Cross-Sectoral

- *National strategy for efficiency in power supply sector* – energy consumed by the power supply industry is significant and, while efforts to improve efficiency and reduce system losses are ongoing, a detailed strategy setting out cost-effective opportunities, priorities and expected savings is necessary to guide further actions. This is listed in the Roadmap as a medium-term priority; however, it is noted that it could also be considered and listed as a more pressing priority in the context of ongoing difficulties and power shortages in different parts of the country.
- *Build stronger coordination with other levels of government including LGUs* – given decentralized decision making processes in the country, it is important that stronger coordination is achieved with other levels of government. This is especially true of the links with local government units/city governments, which have a pivotal stake in implementation of key initiatives like the e-trike project and the enforcement of energy efficiency measures in the building code. To achieve this, capacity will also need to be built in the short term for national government agencies, to allow them to administer programs.

⁵ See for instance the work of Opower in the United States at <http://opower.com/utilities/results/>

- *Regular reporting and monitoring to commence* – Earlier work on data collection and monitoring and evaluation frameworks should enable production of progress reports in the medium term that address issues and set out progress in achieving energy efficiency.

Long Term (2021-30)

Transport Sector

- *EE programs beyond road transport (passenger and cargo ships, aviation fuels)* – road transport is the focus of transport efficiency given its dominance, however substantial opportunities also exist in the longer term to address efficiency in air and sea transport.
- *Reintegration of urban planning and transport energy use* – building on measures introduced to the building code, strengthened ties with LGUs and improved coordination mechanisms on energy efficiency across agencies, in the long term the Government must aim for energy efficiency to be fully and systematically considered in city planning processes.

Industrial Sector

- *Review inward investment rules for EE to remove distortions* – DoE has stated an objective to ensure that new entrants and new investments in industrial plant in the Philippines uses best practice with regard to energy efficiency. In the longer term, it may be appropriate to examine whether certain industrial practices can be encouraged through agreements, restrictions and incentives negotiated with inward investors.

Commercial Buildings Sector

- *Incentive funds in place for EE, including private financiers* – In the long term, following capacity building for the ESCO sector and an increased ability for the commercial finance sector to take energy efficiency risk, Government can facilitate the creation of a privately funded incentive fund or revolving fund that creates a funding pathway for building retrofits. Projects can qualify for funding if they meet certain criteria (e.g. degree of energy savings, procurement model, etc.)
- *Mandatory disclosure of building performance* – efforts to increase existing building ratings penetration will enable a stronger regime of information requirements for commercial buildings, specifically a requirement to disclose building performance on the sale or lease of a building. This information sends an important signal to the market and experience has shown that it can drive uptake of efficient building practices and can create financial returns for energy efficient buildings through differential rental rates.

Residential Buildings Sector

- *Towards energy efficient housing precincts* – in the long term, there may be scope to consider development of energy efficient precincts at e.g. the barangay level or local energy supply co-operative level, rather than nationally. This may allow for more sophisticated measures to support energy efficiency, such as group purchasing of energy efficient equipment, on-bill financing models, and decentralized or on-site energy generation. Target residential areas could be identified as areas that are supply-constrained and in need of additional grid infrastructure to augment current energy supply and ensure energy security; this would act as a demonstration of demand side capability in meeting supply constraints.
- *Inclusion of residential measures in Building Code* – following on from the inclusion of energy efficiency measures for commercial buildings in the national building code, measures for residential housing can also be introduced. This is more difficult based on less stringent controls and enforcement for standard of residential housing in the country.

Cross-Sectoral

- *Energy Efficiency and Conservation Center mandated and established* – the scale of activity as outlined in this Roadmap warrants a creation of a dedicated Philippines Energy Efficiency and Conservation Center, which can act as a focal point and statement of commitment to energy efficiency, and be created with a clear legislative mandate to lead and administer the energy efficiency activities of Government across all agencies. It is also noted that the Enercon Bill contains some provisions to set up such a Center, and that the timing of setting up such a Center should potentially reflect this and position a Center as a precursor to implementation of many of the Roadmap elements. However, consultation with DoE suggests that due to the uncertain timing of the passage of the Enercon Bill, the longer term timeframe for this Center’s establishment remains appropriate.

2.3 Measuring and Monitoring Progress

Given the dearth of robust data and processes for monitoring and evaluating energy efficiency activity in the Philippines, detailed work is required to establish data sources and to create a practical monitoring and evaluation framework. This Roadmap sets out some dimensions of the requirement, but the completion of such a data, monitoring and evaluation framework demands a separate and dedicated plan for implementation.

This aspect of program administration is captured in proposed actions under the ‘Cross-Sectoral’ strand of the Roadmap, to reflect its integral nature in the expansion of energy efficiency programs, and to allow a single program of activities to be represented.

Data collection and management

The current National Energy Consumption Database is incomplete and requires reconstitution on a more robust platform. A more comprehensive data collection and management platform will consider:

- Identification of key data sets – both at a macroeconomic level and by target sector;
- Identification of key potential data contributor organizations and bodies;
- Establishment of data collection protocols and responsibilities;
- Consistency of data storage, including selection of an appropriate ICT and data management platform;
- Responsible for ensuring data quality and checking/control procedures;
- Procedures for how and how often data is collected, compiled, sent, and analyzed;
- What resources will be needed at each stage of data management;
- Identification of who will be responsible for data analysis, and against which parameters analysis will be applied;
- Identification of to whom and how often results will be disseminated.

As a separate effort in establishing data management and commencement of reporting, it is desirable for the Philippines to undertake an Energy Intensity Study with the explicit aim of separating efficiency effects from the effect of changing economic composition when measuring energy intensity. Part of this study would outline consistent methodology for calculating sectoral economic growth, such that energy intensity of each sector could be adequately measured. This study could build on existing work such as input-output (I-O) matrices being developed for the Philippines economy and would allow future evaluation efforts to gain a more complete picture of the true effectiveness of energy efficiency programs.

Monitoring and Evaluation (M&E)

A well-functioning M&E system manages to integrate the more formal, data-oriented side commonly associated with the task of M&E together with informal monitoring and communication. Cast in this way, M&E will act as an integrated system of reflection and communication supporting project implementation over the entire life of the project. M&E is not only a data collection and monitoring task; evaluation requires an interpretation of the information and mechanisms to review programs and adjust strategy to ensure that the long-term objectives of the Roadmap can be met. Seeing M&E as an integrated support system for those involved in project implementation, requires:

- creating M&E processes that lead to clear and regular learning for all those involved in project strategy and operations;
- understanding the links between M&E and management functions;
- using existing processes of learning, communication and decision-making among stakeholders as the basis for project-oriented M&E;
- putting in place the necessary conditions and capacities for M&E to be carried out.

Typical steps of developing the M&E framework might include:

- Stakeholder Consultation and Participation – defining the process for stakeholder involvement at each stage of the framework’s development.
 - Translating the Roadmap’s goals and objectives into the M&E framework, effectively establishing the scope of the M&E plan
 - Determining which elements must be monitored and evaluated
 - Defining sectoral indicators and identifying data sources
 - Determining M&E methods for data and information collection (linked closely to data collection plans)
 - Determining M&E responsibilities
 - Defining the reporting system, utilization and dissemination of results
 - Planning for mid-course adjustments

If data quality and resources allow, it may be desirable to include interim targets for short-, medium- and long-term energy savings objectives in future refinements of the Roadmap.

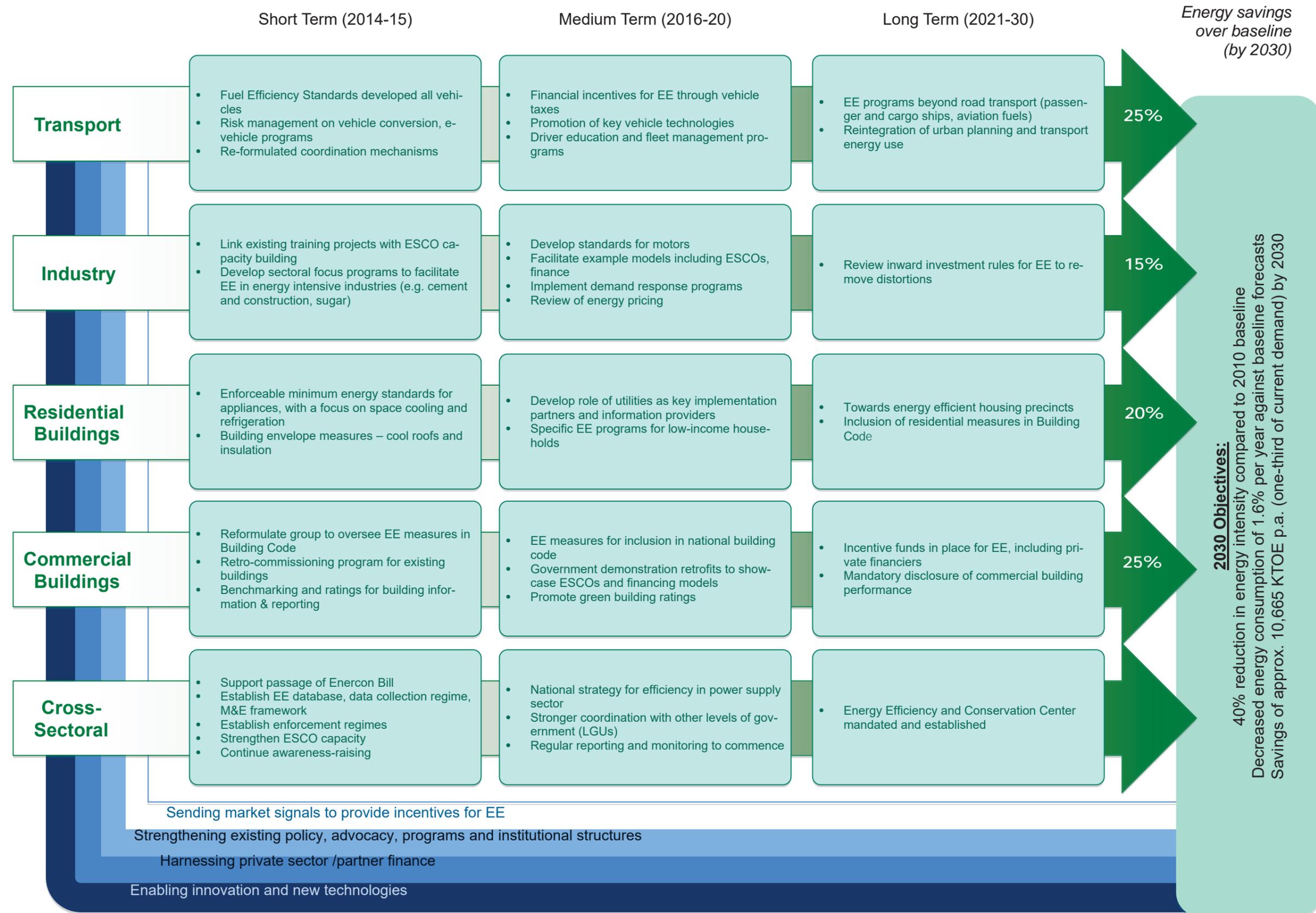
Reporting

The Roadmap proposes consolidated evaluation of progress to be reported publicly every 2 years, with the first report compiled by the end of 2015.

2.4 The Roadmap in Summary

A graphical representation of the Roadmap is provided in Figure 4 that follows.

Figure 4: An Energy Efficiency Roadmap for the Philippines, 2014-2030



2.5 The way forward

If adopted by the Philippines Government, this Roadmap changes the emphasis of energy efficiency programs. As a result, key stakeholders must be consulted so that their views are captured and their abilities to contribute can be beneficially integrated.

For each target sector, more detailed action plans will be required to better articulate how each priority will be implemented. Action plan development should draw upon existing activity as a starting point, and build in the lessons of successful approaches from elsewhere. The action plans will provide more detail on roles and responsibilities, allocation of resources, principal policy and regulatory mechanisms that may need to be established, and partners to implementation.

As noted a further, over-arching action plan will be required to set up data collection, monitoring and evaluation in support of the overall program of activity. An important aspect of this plan will be its mechanisms to allow further consultation with and feedback from key energy efficiency stakeholders, to ensure that the Roadmap remains relevant to the energy efficiency activity that is being implemented. This plan and its system for measurement of progress will enable Government to justify its increased focus on energy efficiency, and to make mid-term adjustments to strategy, according to the lessons and experience that it gathers as implementation unfolds.

ANNEXES

ANNEX 1: RECOMMENDED PRIORITY ACTIONS FROM POLICY REVIEW NOVEMBER 2013

Transport

- Closer support to manage identified risks in vehicle conversion and e-vehicle/e-trike programs
- Fuel Efficiency Standards for light-duty vehicles, vans/jeepneys, tricycles and heavy vehicles (trucks)
- Promotion of key vehicle components and technologies that are cost effective in improving vehicle fuel efficiency, through incentives and rebate programs
- Fiscal incentives for EE through vehicle registration, duties and taxes
- Driver education programs
- Re-formulated coordination mechanisms with other agencies

Industry

- Sectoral programs to facilitate EE uptake in heavy user industries (cement and construction, sugar and food processing)
- Extending existing training to enfranchise ESCOs instead of individual energy managers
- Facilitating example business models including financing models

Residential Buildings

- Enforceable minimum energy standards for appliances, with a focus on space cooling and refrigeration
- Building envelope measures (many homes are poorly insulated)
- Develop role of utilities as key implementation partners and information providers

Commercial Buildings

- Programs for retro-commissioning of existing buildings
- Benchmarking of building energy use to create data for building information and reporting
- Energy efficiency measures for inclusion in national building codes
- Using government's procurement capacity for demonstration building upgrades that also build capacity of the ESCO sector

Cross-Sectoral

- Fiscal incentives such as through vehicle taxes, property rates, or trade and investment rules
- Facilitation of energy services sector development, including support for financing models
- Targeted utility/power generation sector efficiency programs

ANNEX 2: OTHER RECENTLY RECOMMENDED ENERGY EFFICIENCY STRATEGIES AND ACTIONS

IEA Southeast Asia Recommendations for unlocking energy efficiency potential

The IEA released its Southeast Asia Energy Outlook publication in October 2013. It is mostly concerned with energy supply scenarios for the region, however, it strongly acknowledges that energy savings can be a very important and cost-effective source of additional energy “supply” for the region and also deliver substantial economic gains.

The IEA contends that there is no single measure that would trigger wide-scale adoption of energy efficiency measures and policies throughout the region, and that barriers to implementation differ widely. However, based on its review of current energy efficiency status in Southeast Asia, it suggests that unlocking energy efficiency’s potential rests on addressing challenges in several key areas:

- **Enhance national policy co-ordination and regulatory frameworks.** Closer co-operation among competent authorities should be enhanced in order to maximize energy savings across all sectors. Governments need to adopt realistic and measurable targets, implement effective mandatory and voluntary policies and standards, and ensure stricter compliance with measures in place, including:
 - **Industry:** strengthen expertise and training for energy audits and energy management; encourage the use of best available energy practices and technologies.
 - **Transport:** establish mandatory fuel-economy standards and labeling initiatives; introduce financial (tax) incentives to encourage the purchase of energy-efficient vehicles.
 - **Buildings sector:** implement progressively more stringent building energy codes and mandatory energy performance standards for all energy-consuming products, and strengthen compliance and enforcement mechanisms.
 - **Power sector:** encourage the deployment of high efficiency coal-fired generation technologies (supercritical, ultra-supercritical and integrated gasification combined-cycle (IGCC) plants); support efficient electricity networks in order to optimize power flows and reduce transmission and distribution losses.
- **Eliminate market distortions.** Artificially low energy prices remain commonplace in several Southeast Asian countries. These undervalue energy efficiency returns and discourage consumers and industry to invest in energy-efficient practices and equipment.
- **Promote energy efficiency awareness and visibility.** Governments should encourage better knowledge of energy efficiency dynamics and make the cost-saving benefits of new practices and efficient technologies more visible in the public and private sectors.
- **Encourage the financing of energy efficiency projects.** Many financial institutions throughout the region are reluctant to support energy efficiency projects because of a lack of relevant experience and technical expertise as well as skepticism about potential returns. Governments will need to take a more active role in developing energy efficiency markets beyond their infancy. Adopting well-designed financial instruments (such as co-financing schemes, loans, national grants and special funds) as well as supporting the development of ESCO activities could provide a decisive boost in creating functional energy efficiency markets.

- **Improve capacity building and data collection.** Energy efficiency is relatively new on the agenda in Southeast Asia. Institutions and industries are still developing expertise in implementing best practices and building capacity in energy management. Moreover, to assess its potential and make it visible to the market, energy efficiency needs to be measurable. To this end, most countries in the region should expand their energy data collecting and analysis capacity, and present energy data at a more disaggregated level, in line with evolving international practices.
- **Monitor and evaluate the effectiveness of energy efficiency policies.** The introduction of energy efficiency policies does not alone ensure the achievement of objectives or targets. Governments need to develop procedures and tools, including the use of energy efficiency indicators, to monitor effects of policies introduced and implement adjustments when needed.

APEC - Peer Review Recommendations

The APEC Peer Review of Energy Efficiency policies completed in 2012 set out fifty-four recommendations for future energy efficiency action, which have been considered in development of a revised Roadmap:

Institutional Context

Recommendation 1 Closer coordination among relevant departments should be enhanced in order to maximize energy saving across the various sectors in the Philippines. More coordination between central government and local governments should be enhanced so as to maximize energy saving across the various regions in the Philippines.

Recommendation 2 More human resources and budget should be provided for institutions which are responsible for EE improvement in various sectors/areas.

Recommendation 3 A proposed EE and Conservation Centre of the Philippines should be carefully considers in terms of its distinctive role, funding etc. in Enercon Bill.

Energy Efficiency Goals, Targets and Strategy

Recommendation 4 Integrate energy efficiency plans and policies across the Government

Recommendation 5 Enhance the Government Energy Management Program (GEMP) visibility in the government by having it lead the Interagency Energy Efficiency and Conservation Task Force.

Recommendation 6 Develop and Implement a National Action Plan for Energy Efficiency

Recommendation 7 Create a pathway with annual timelines to meet the stated energy efficiency targets.

Recommendation 8 Set individual sector goals and develop a more robust energy consumption database.

Recommendation 9 Modify low carbon scenarios, which currently rely heavily on renewable fuels, to reflect more aggressive EE targets across all sectors

Recommendation 10 Establish a K-12 and University energy efficiency schools program

Recommendation 11 Create a national public education and awareness campaign for energy efficiency. Tie in important national overarching goals in the message.

Recommendation 12 Create an energy efficiency framework that is focused on the low-income people of the Philippines

Recommendation 13 Create an economic environment for utilities to provide energy efficiency services to the people and businesses of the Philippines

Energy Data Collection and Monitoring

Recommendation 14 Establish Data Centre and Information of Energy Conservation to enhance data analysis function.

Recommendation 15 Improving data collection and monitoring through different data collection system.

Industry Sector

Recommendation 16 As the DOE regularly conducts IEC it is highly recommended to device a feedback mechanism (e.g. poll exit during IEC; feedback/callbacks on audits) after an information campaign and energy audit is conducted.

Recommendation 17 There is a need to strengthen ties with private sector to increase its participation in recognition awards and in other efforts of the government on energy efficiency and conservation.

Recommendation 18 Continue constant, close cooperation with other government agencies, ESCOs, and other entities for successful energy conservation;

Recommendation 19 It is highly recommended that the programs and projects of the agency be carried over even after the project is completed.

Recommendation 20 The DOE should enjoin active participation of private sector/industries in lobbying for the passage of Enercon Bill as its enactment will benefit both the government and the industry sector.

Electricity Sector

Recommendation 21 DOE should continue to request the power producers to improve the heat rate for fossil power units of its power plants.

Recommendation 22 DOE should consider requesting the supply-side (generation, IPPs and energy supply companies) to improve the average efficiency of existing thermal power units.

Recommendation 23 DOE should request or encourage the power development plans/power companies to adopt the best available technologies for new generation units.

Recommendation 24 It is deem necessary that DOE and private power companies adopt more efficient schemes for promoting energy conservation to reduce peak load power demand.

Recommendation 25 The National Grid Corporation of the Philippines (NGCP), the National Transmission Corporation (TransCo) and the National Electrification Administration (NEA) should make continuous efforts to further improve transmission & distribution reliability, efficiency and reduce system losses.

Commercial and Residential Sectors

Recommendation 26 Government should “*lead by example*” to set up as a model for the private sector to follow.

Recommendation 27 Promote “Cool Roofs” for all low rise buildings and work to include it within the Green Building Design and eventually in Building Codes

Recommendation 28 Initiate a program to develop Commercial and Multi-family (e.g. condo type) Building Labels – start with a voluntary pilot introduction

Recommendation 29 Promote “ESCOs” in commercial and government building retrofits and continue training more lending institutions on the benefits of financing the resulting projects

Recommendation 30 Initiate legislative and regulatory actions to “fast track” a mandatory Building Energy Efficiency Code program for the Philippines

Recommendation 31 Develop a comprehensive and mandatory building energy consumption survey in order to better understand the types of buildings and their energy consumption

Transport Sector

Recommendation 32 Consider the further integration of **land use planning** with transport. Efforts could be taken to minimize urban sprawl of cities, by ensuring that new developments occur around public transport corridors. Excessive travel can be minimized through mixed land use planning, coupled with the improvement of non-motorized transport infrastructure and public transport systems.

Recommendation 33 Consider the development of **financial mechanisms** and **national programs** to encourage/incentivize local governments to replicate and scale up good practice. Lessons may be drawn from for instance India, where the national government is making available funding for sub-national governments to improve urban transport, under certain criteria (such as the existence of a comprehensive mobility plan).

Recommendation 34 Focus on **low hanging fruit**: e.g. the introduction of fuel economy standards, financial (tax) incentives that favor energy efficient vehicles, transport demand management etc. These measures can be implemented at very little financial cost, but require strong political leadership to implement.

Recommendation 35 Work **across sectors**. For example, the introduction of electric vehicles can be coupled with efforts to minimize upstream emissions from electricity generation, through measures taken in the energy sector. The potentially negative impacts of biofuels on food prices could also be mitigated through strong policies in the agriculture sector.

Recommendation 36 Continue to enhance **interagency coordination** to holistically support energy efficient, sustainable transport. This would particularly be true in urban areas, where transport systems dissect different political boundaries. Mechanisms can be strengthened to ensure that local government units can cooperate to achieve their common goal of sustainable and efficient transport.

Energy Management Mechanism and Training

Recommendation 37 Combined different energy management activities together to fully use of the government resource in a more systematic way in order to collect more data for future benchmark and plan the future energy conservation action.

Recommendation 38 Expand the mechanism of spot check to cover the private sector.

Recommendation 39 Fully use of the professional engineers in the private sector (such as professional engineer association, research institute, academic, ESCO association, etc.) to expand the energy management services (such as spot check, energy audit, etc.)

Recommendation 40 Set up a database about the information of participants in different kind of training workshop.

Recommendation 41 Request the participants to fill in an evaluation form and express their comments and suggestion for the training workshop.

Recommendation 42 Compile the best practices of those companies which received the energy conservation related awards from the government and publish these successful practices for other companies to follow or future reference.

Recommendation 43 Help the ESCO industry to set up the M&V (measurement and verification) regulations and guideline for the evaluation of energy conservation credit.

Recommendation 44 Help ESCO industry to solve the financial problem by set up a fund or provide low-interest loan.

Appliances and Equipment

Recommendation 45 The new coming label with star ranking system is easier to understand than the present one. However EE label for every product does not have the same pattern. All appliances should be adjusted to the new pattern with star ranking system. One Message for All!

Recommendation 46 Cost of annual energy consumption can also be indicated on the label.

Recommendation 47 The data that can be shown on the label would serve as reference for comparison for consumer.

Recommendation 48 For the consumer to get enough information before they purchase a product, the label should not only be put on the products but information should also be displayed in the store.

Recommendation 49 EE S&L roadmap should be set to cover all sectors i.e. household, commercial, industry, transport and agriculture in short, medium and long terms. For example, setting MEPS & HEPS for building envelopes materials i.e. glass window, insulator, roof tile, and etc. can support energy conservation in building programs. In addition, machinery and equipment, which can reduce energy consumption, should be planned accordingly to set up EE standard such as variable speed drive (VSD).

Recommendation 50 Enhance financial support for high efficient products through revolving fund, direct subsidy, etc.

Recommendation 51 To ensure energy saving for lighting, the introduction of high-energy efficient lighting fixture can be considered to be integrated with the lighting environment design. It can attain the same illumination with less lighting fixture.

Recommendation 52 Please consider to set up the guideline for the design of motor application to help carrying out the MEPS for motor (such as how to design the fan, pump, etc.) It is understood that the effect of energy conservation needs to start from the system design with the enforcement of different EE standards.

Recommendation 53 Capacity building for testing laboratories is important. To make sure that testing results are accurate, the testing facilities should not only have the capability but the technical staff's skills for testing as well needs to be developed.

Recommendation 54 Public awareness for using high efficient appliances and equipment should be promoted covering all sectors. Moreover, the current and previous public awareness should be evaluated to identify the gap where the Philippine government can find area for further improvement or emphasize successful program.

ANNEX 3: MINUTES OF STAKEHOLDER CONSULTATION MEETING**Stakeholder Consultation Meeting
on the
Energy Efficiency and Conservation Roadmap
developed for the Philippines Department of Energy**

**F1 Hotel, Bonifacio Global City, Manila
December 10, 2013
9:00am – 12:00nn**

Attendees:

1. Amelia De Guzman, OIC Director of ERTLS, DOE
2. Jesus Anunciacion, OIC Director of EUMB, DOE
3. Artemio Habitan, Division Chief of EECD, DOE
4. Mirna Campanaño, Division Chief of LATD, DOE
5. Lilibeth Morales, Sr. Science Research Specialist of PFRD, DOE
6. Ricardo Yambao, Sr. Science Research Specialist of AFETD, DOE
7. Genevieve Almonares, Sr. Science Research Specialist of EECD, DOE
8. Alexis Matel Carlos, Science Research Specialist II of EECD, DOE
9. Annie Ornillo, Science Research Specialist of EECD, DOE
10. Renente Seralla, Sr. Science Research Specialist of LATD, DOE
11. Ruel Lacambra, Investment Promotion Office, DOE
12. Rodel Cortez, Principal Engineer, National Power Corporation
13. Jean Centeno, Division Chief, Rural Infrastructure and Support Services Division, NEDA
14. Arnold Belver, Planning Officer III, Research & Policy Development Division, Climate Change Commission
15. Glenda David, Senior EMS, Department of Transportation and Communication
16. Romeo Cometa, Philippine Textile Research Institute, DOST
17. Loreto Carasi, Engineer, Philippine Council for Industry and Energy Research and Development, DOST
18. Matthieu Penot, Attaché Environment, Energy & Climate Change, Delegation of the European Union to the Philippines
19. Josephine Mangila-Tioseco, Country Coordinator, Low Emission Asian Development Program, USAID
20. Andrew Kho, Technology Development Executive, Pilipinas Shell Petroleum Corporation
21. Reynaldo Legada, Senior Energy Advisor, EASCORP
22. Ram Machica, STI Technical Assistant, Federation of Philippine Industries
23. Ma. Anna Tungol, Executive Director, Philippine Green Building Council
24. Richard Uy, President, Energy Practitioner Association of the Philippines
25. Marianna Pacua, Operations Analyst, IFC
26. Lucky John Florido, PA-III, PCIEERD – DOST
27. Danilo Aquino, ES Specialist, Meralco
28. Ron Caringal, ES Specialist, Meralco
29. Edwin Santillan, ES Specialist, Meralco
30. Archimedez Diaz, Consultant, EECP
31. Juergen Bischoff, Team Leader, EU – Switch Philippines

32. Maria Eloida Balamiento, Energy Adviser, EU – Switch Philippines
33. Denise Tiampong, Secretary, EU – Switch Philippines
34. Lionel Angelo Abliter, Office Assistant, EU – Switch Philippines
35. Mark Lister, Project Consultant, EU – Switch Philippines

Welcome Remarks

Director Jesus C. Anunciacion of the Energy Utilization Management Bureau opened the meeting, remarking that it was very important to receive feedback and input from stakeholders in the ongoing development of the DoE's energy efficiency and conservation program, outlining the agenda for the meeting, and thanking contributors including the EU-SWITCH Asia Policy Support team and organizers.

Opening Remarks

Mr Matthieu Penot, Attaché Environment, Energy and Climate Change of the Delegation of the European Union to the Philippines, opened the meeting referring to the regional work of the EU-SWITCH program and outlining why it includes an emphasis on energy efficiency, including its comparatively low cost as a solution for meeting energy needs, ensuring energy security and mitigating climate change

Acknowledgement of Guests

Attendees briefly introduced themselves and the organizations they were representing.

Coffee Break

Project Background

Maria Balamiento, Energy Adviser, EU-SWITCH Policy Support Programme provided some background to the scope of EU-SWITCH work in the Philippines, and to the terms of reference for the project being presented in this consultation workshop, which was developed at the request of DoE to assist with long term energy efficiency planning and strategy.

Presentation of Draft Energy Efficiency and Conservation Roadmap

Mark Lister, Consultant under the EU-SWITCH Policy Support Programme presented the findings of the recently completed reports to develop the Energy Efficiency Roadmap 2014-30, including a detailed policy review of the existing National Energy Efficiency and Conservation Program and other policies on energy efficiency, and the initial draft of the EEC Roadmap.

Open Forum

The floor was opened to questions. Participation was strong with the following issues raised and discussed:

- Capacity building activity appears to be focused on the private sector, including the energy services (ESCO) sector. Capacity should also be built in the short term for public sector organizations such as DoE and local government units, to allow them to be better able to administer programs and also better consider energy efficiency in their own procurement processes.
- The importance of a strategy for efficiency in the power sector, given short-term problems in meeting electricity demand already being experienced in many parts of the country.
- The need to create consistency and alignment with other long-term strategies and plans by sector, including transport strategies, industry strategies, the Philippine Development Plan and National Climate Change Action Plan, as well as to review activities underway to ensure that they are designed in reference to and streamlined with the roadmap's development.

- Questions about the methodology for setting the proposed targets (i.e. based on international evidence and adjusted for local conditions).
- The possibility of including interim targets for short-, medium- and long-term energy savings objectives.
- The need for further consultation with a wider stakeholder group as this Roadmap is further developed.
- The timing for the setting up of an Energy Efficiency and Conservation Center in the long term was questioned – because it was seen as a key agency to implement most of the proposed program. It was also noted that the Enercon Bill contains some provisions to set up such a Center, and that the timing of setting up such a Center should reflect this.
- The issue of energy intensity as a target was discussed, and the importance of separating out changes in economic structure from the impacts of genuine energy efficiency, noting that further work on this was required.
- The need to keep ongoing momentum behind the promotion of green building ratings, with an emphasis on operational performance.
- The Climate Change Commission representative explained that the Philippines is currently working with UNEP in development of Nationally Appropriate Mitigation Actions (NAMAs). This Roadmap is timely as a contribution to the NAMA process and considering the savings that may be available from the building sector. Proposed energy benchmarks for the building sector will be very important.
- The need to measure impact and outcomes of programs was re-iterated, particularly information campaigns that may also need to be targeted to large industrial users, rather than just to residential consumers.
- The importance of the Energy Efficiency and Conservation Bill being passed was noted in creating an enforcement regime, where at the moment it is difficult to compel energy users to comply with policies.
- The focus of the presentation on ‘how’ to implement the Roadmap, especially in relation to ESCOs, was welcomed. Other regulations and government requirements will need to be refined to enable energy efficiency and to grow the ESCO sector.
- Lighting replacement should remain as a major component of energy efficiency activity, though it is already implicit in the Roadmap through proposed retrofit activities.

Presentation of Timeline/Way Forward

Mr Mark Lister briefly presented recommended plans to take the Roadmap forward, consisting of the development of five detailed action plan to better articulate how priorities will be implemented for each sector (one for each of the four priority sectors, and one stand-alone plan for data collection, monitoring, evaluation and enforcement). These action plans will provide more detail on roles and responsibilities, allocation of resources, principal policy and regulatory mechanisms that may need to be established, and partners to implementation.

Closing Remarks

Dr Jurgen Bischoff, Team Leader EU-SWITCH Philippines closed the meeting by expressing appreciation for the work of the meeting organizers and the Master of Ceremonies, the effort put into the content that was presented, and the quality of audience participation and questions.

Dr Bischoff closed the meeting by thanking all contributors and noted his view that we have taken a step in the right direction towards improved energy efficiency and conservation in the Philippines.

Meeting Closed 12:05pm.

ANNEX 4: REFERENCES

APEC Energy Working Group (2012), *Peer Review on Energy Efficiency in the Philippines, First Draft Report*, May 2012

APEC (2007), *Sydney APEC Leaders' Declaration on Climate Change, Energy Security and Clean Development*, September 2007, accessed at http://www.apec.org/Meeting-Papers/Leaders-Declarations/2007/2007_aelm/aelm_climatechange.aspx

IEA (2011), *Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems*

IEA (2013), *Southeast Asia Energy Outlook*, October 2013

IFAD (2013), 'A Guide for Project M&E', accessed at <http://www.ifad.org/evaluation/guide/index.htm>