THE TECHNICAL ADVISORY GROUP REPORT TO THE CONSULTATIVE GROUP, MARCH 31 2017

ON THE ENERGY TRUST FUND PROGRAMS: ENERGY SECTOR MANAGEMENT ASSISTANCE PROGRAM & ASIA SUSTAINABLE AND ALTERNATIVE ENERGY PROGRAM

March 31, 2017

Authors: Ms. Tamara Babayan, Mr. John Heath and Ms. Richenda Van Leeuwen

Contents

ABBREVIATIONS AND ACRONYMS

ABG	**Annual Block Grant**
AFR	**Africa Region**
AFREA	**Africa Renewable Energy Access Program**
ASTAE	**The Asia Sustainable and Alternative Energy Program**
BLEN	**Biofuels, LPG, Electricity, Natural Gas**
BNEF	**Bloomberg New Energy Finance**
CE	**Clean Energy**
CEETI	**City Energy Efficiency Transformation Initiative**
DFID	**Department for International Development (UK)**
EA	**Energy Access**
EAP	**East Asia Pacific Region**
EASP	**Energy Strategies and Assessment Program**
EECI	**Energy Efficient Cities**
ECA	**Europe and Central Asia Region**
EDGE	**Excellence in design for Greater Efficiencies**
EE	**Energy Efficiency**
ESCO	**Energy Service Company**
ESMAP	**Energy Sector Management Assistance Program**
FY	**Fiscal Year (FY2016 refers to the year ending 30 June 2016)**
GCF	**Green Climate Fund**
GTF	**Global Tracking Framework**
GGDP	**Global Geothermal Development Plan**
GOGLA	**Global Off Grid Lighting Association**
GW	**Gigawatt**
ICEIDA	**Icelandic International Development Agency**
IDA	**International development Association**
IFC	**International Finance Corporation**
IFI	**International Financial Institution**
IRENA	**The International Renewable Energy Agency**
KfW	**Kreditanstalt für Wiederaufbau**
LCR	**Latin America and Caribbean Region**
LPG	**Liquefied Petroleum Gas**
M&E	**Monitoring and Evaluation**
MDB	**Multilateral Development Bank**
MNA	**Middle East and North Africa Region**

MTF	**Multi-Tier Framework**
NDC	**Nationally Determined Contribution**
NREL	**National Renewable Energy Laboratory**
OECD	**Organization for Economic Development and Cooperation**
PAYG	**Pay as you go**
PPIAF	**Public-Private Infrastructure Advisory Facility**
PV	**Photovoltaic**
RBF	**Results Based Funding**
RE	**Renewable Energy**
RISE	**Regulatory Indicators for Sustainable Energy**
SAR	**South Asia Region**
SDG	**Sustainable Development Goal**
SE4ALL	**Sustainable Energy for All**
SEAR	**State of Energy Access Report**
SIDS-DOCK	**Small Island Developing States – Docking Station**
TA	**Technical Assistance**
TAG	**Technical Advisory Group**
TRACE	**Tool for Rapid Assessment of City Energy**
UN	**United Nations**
USAID	**United States Agency for International Development**
VRE	**Variable Renewable Energy**
WHO	**World Health Organization**

1 FOREWORD

This report has been prepared by the Technical Advisory Group (TAG) composed of Ms. Tamara Babayan, Director of the Armenia Renewable Resources and Energy Efficiency Fund, Mr. John Heath, Independent Consultant and Team Leader, East Africa Geothermal Facility, and Ms. Richenda Van Leeuwen, Chair, International Institutions, at the Global LPG Partnership.

As with prior annual TAG reports to the Consultative Group (CG), TAG has used as input both the Annual Report FY2016 and the draft Portfolio Review FY2016 of the Energy Sector Management Assistance Program (ESMAP) and the Asia Sustainable and Alternative Energy Program (ASTAE). In addition, TAG reviewed the financial data provided by ESMAP management.

The terms of reference of the TAG are: “Provide advice on ESMAP and ASTAE’s overall priorities and their development into WB operations, as well as the strategic impact of existing and new programs, to inform the CG in its assessment of the success of the programs in influencing WB operations in the energy sector and the wider energy-for-development community."

The CG members were approached for specific areas of focus within this year’s TAG review, and several provided input via e-mail and conference calls.

Meetings were held in Washington, DC with ESMAP, ASTAE and World Bank staff on different thematic areas during a visit to Washington, DC from February 4-12, 2017. This included meetings with ESMAP senior management and the recently appointed Senior Director, Head of Energy and Extractives Global Practice, Mr. Riccardo Puliti, and Mr. Lucio Monari, the newly appointed Director at the Practice. For those staff on mission, tele-meetings were held during TAG’s meetings, and during the following two weeks when they could not be immediately scheduled.

TAG appreciates efforts of ESMAP team for the excellent organization of all meetings and presentations.

For the next year TAG recommends to allow more time to TAG for summarizing the information provided and for preparation of the report. For example, this year the final discussions with ESMAP Program Leaders were not held until 23 February, five days before submission of the report.

2 SUMMARY OF KEY OBSERVATIONS AND RECOMMENDATIONS

2.1 RELATED TO THE CONTEXT

2.1.1 ESMAP Priorities

During the last several years ESMAP has been reviewing its priorities based on World Bank commitments toward the global climate change agenda. The Business Plan for FY2017-20 articulates ESMAP's critical role in successful implementation of the World Bank's strategy in the energy sector as well as its Climate Change Action Plan. The main challenge for addressing the need for support to the World Bank operations in the sustainable energy scale up and access to modern energy may be possible underfunding or shortage of ESMAP resources. It is noted that current levels of funding will in time lead to a need for ESMAP to prioritize its programs and activities. At the same time TAG notes that there are opportunities to utilize ESMAP skills and expertise in new ways that may help to break through existing barriers to support progress on the key sustainable development goals.

TAG agrees that Africa should remain a priority focus for energy access, both for electrification and clean cooking and heating. Access in parts of South and South East Asia, however, also remains a challenge for both electrification and cooking, as in certain countries in other regions (e.g. Haiti) and ESMAP's regional engagement, such as in off-grid electrification in Myanmar, is considered of critical value in the next three years. At the same time, "green growth" and energy efficiency (avoided emissions) remain important focus areas to ensure that middle income countries adopt pathways that do not lock them into high emissions activities for the coming decades, and have the resources needed to deliver on their NDCs.

2.1.2 Key Risks to Progress towards SDGs

Given the context of ESMAP constraints and the need to consider energy access in Africa as the highest priority for development, TAG noted that the Africa Region reported that the major barriers to improved access were the financial viability and operational capability of utilities. Reform programs that have brought success and improved access in other regions have failed to deliver in Africa. Therefore TAG recommends that ESMAP explores how it can bring together its expertise in order to help re-define approaches to energy access in much of Africa, covering for example:

- Re-thinking the nature of the grid businesses, given the reality of the financial and economic position of the utilities, and the reducing costs of mini-grid and off-grid solutions.
- In any one country further strengthening coordinated approaches involving ESMAP skills in tariffs and subsidies, geospatial planning, system planning, markets, grid integration, mini-grid and off-grid development. An example where this approach has been developed to a significant extent is Kenya.
- Further enhance extension of the product offerings on subsidy reform and grid integration to incorporate system optimization, market operations, cross subsidies and the analysis of commercial risks. Important issues include: demand forecasting, supply/demand balancing risks, negative impact of increased connections on utility viability, clarity of tariff, subsidy and cross-subsidy strategies.

It is noted that the principal driver of this approach would be the World Bank Regional teams, but ESMAP could seek to influence their work through the extended product offering.

More specific ideas are included in the commentary on the individual programs in the body of the report. While this approach would not per se give preferred status to renewables, it could in fact give a major boost to the effective utilization of renewables by defining much more clearly the appropriate role for the different energy sources in the current, and more importantly, future markets.

While the recommendations above relate mainly to Africa, it is important that ESMAP continues to assist middle income countries in other regions in order to complete the access agenda, to improve the mix of energy sources and to reduce reliance on fossil fuels, but also to continue to develop ways of delivering strategic goals that can then be transferred to lower income countries. Examples may be: tariff, subsidy and cross-subsidy strategies, energy efficiency, and impacts of urbanization (urban poor, efficient cities).

2.2 Related to the Consultative Group

2.2.1 Framework for Coordination of Donor Activities

Linked to the above recommendation TAG would like ESMAP and its donors consider how a more integrated approach to the question of energy access in Africa (primarily – there are countries in other regions to which the same issues apply) could be used to strengthen strategic frameworks for any one country within which donor activities can best be coordinated. If there is a common agreement, based on the World Bank's convening power, of the strategic framework, there is a much lower risk that individual donor activities will have unintended consequences. TAG recognizes ESMAP's work under SE4ALL Technical Assistance program and existing engagement in this process, and that some residual challenges reside beyond ESMAP. TAG also recommends donors to use opportunities through the Knowledge Exchange Forums to provide information on their bilateral or ESMAP activities in the same thematic area or region.

2.2.2 Multilaterals versus Bilaterals

Current trends in aid indicate a move politically towards bilateral rather than multilateral arrangements, and the reduction in ESMAP funding is a symptom of this. TAG would support recognition by donors considering a move to a more bilateral approach of the value of ESMAP's expertise and knowledge in being effectively applied as a background strategy and baseline for information that all donors can utilize in determining the most appropriate role for themselves. Working through the multilateral program will be more efficient than each donor undertaking its own strategic analysis. Examples of this are: renewable mapping with regard to action to promote clean energy and efficient cities with regard to urbanization. In addition ESMAP analysis could be used to define a sector wide strategy for any given country based around the issues of the financial viability and operational capability of utilities and the most economic approach to access between grid and off-grid. If ESMAP's objective view of energy and access strategies was used by donors as a common baseline then it would reduce the risk of donors spending bilateral funds in an uneconomic way. One possible example could be a situation in which the analysis leads to the recognition that some grid connections are in fact not economic even if donors are minded to subsidize the cost of the connection.

TAG recognizes that there may be sensitivities in this approach, not least because the political economy of any one country may be based around a different and less appropriate set of policies compared with the objective analysis. This is a matter for donors to consider.

2.3 Related to ESMAP

TAG was impressed by the expertise of the ESMAP teams, and its recommendations above relate to how that expertise may be leveraged in future rather than any comment on the existing performance. If the approach leads to new ESMAP products then this may stimulate additional donor interest.

For the new four-year business plan, TAG advises ESMAP management to continue to work with donors to try where possible to gain multi-year commitments that underwrite the full four-year business plan, and continue outreach to new donors, as has already begun. New donors may take on specific projects, while recognizing that targeted donations received should be supplemental to, rather than replace core support from bilateral agencies.

Given the global pace of innovation on technology relevant across the renewable energy sector, and that the majority of research and development takes place in OECD countries, TAG further recommends that ESMAP explore ways to more fully bring cutting edge technological research to bear on its programming, and particularly help ensure that World Bank staff and stakeholders have access to the latest research that may have very practical considerations pertaining to policy planning and programs in future years. One way to capture this could be as part of ESMAP's global activities, through developing new and strengthening existing partnerships with some of the laboratories working on renewable energy, energy storage and green fuels research and applications, and through convening global or regional energy innovation conferences that bring together research communities alongside policy makers and planners and other stakeholders. This can help to facilitate more knowledge exchange around what constitutes relevant cutting edge solutions, especially in a fast changing renewable energy landscape.

While this summary sets out the principal TAG recommendations, the body of the report includes a number of other suggestions and ideas.

2.4 Related to ASTAE

The progress of implementation in ASTAE is strong but it is clear that for the last year of ASTAE's business plan a strong focus needs to be maintained on implementation. TAG recommends continued close monitoring of progress so that funds can be reallocated quickly where necessary. It is clear that after closure of two ASTAE regions, SAR and EAP will have difficulties in timely support for their activities given the current shortage of contributions, as well as losing the predicable approach they had earlier.

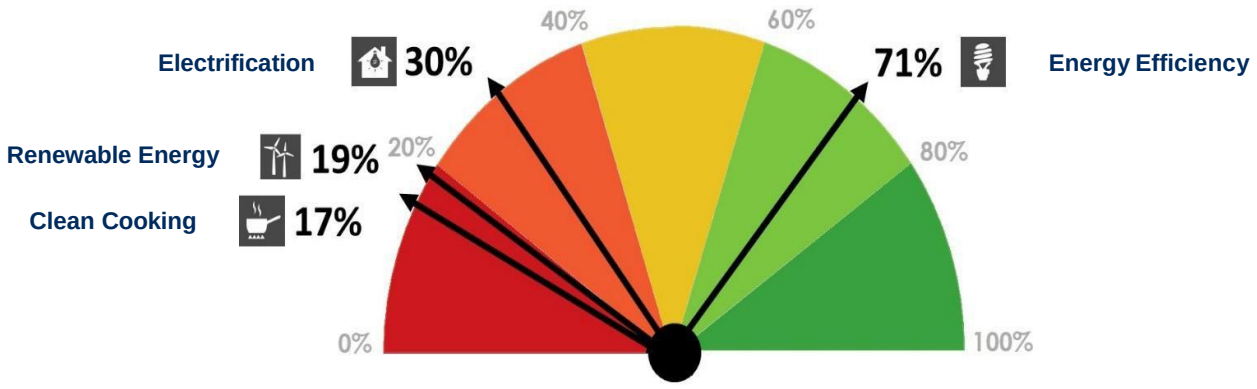
ASTAE measures its performance based on six indicators which include World Bank lending catalyzed, and others related to renewable electricity capacity and generation, energy access and CO_2 savings. The progress is more than satisfactory for all indicators except for households with access to modern energy services.

TAG recommends continued tracking of the activities similar to ASTAE using the same indicators, in order not to lose valuable information after the closure of ASTAE.

3 CONTEXT

3.1 Progress Towards SDG Goals

Figure 1 | Progress towards 2030 SE4ALL Goals



Source: Global Tracking Framework, 2017.

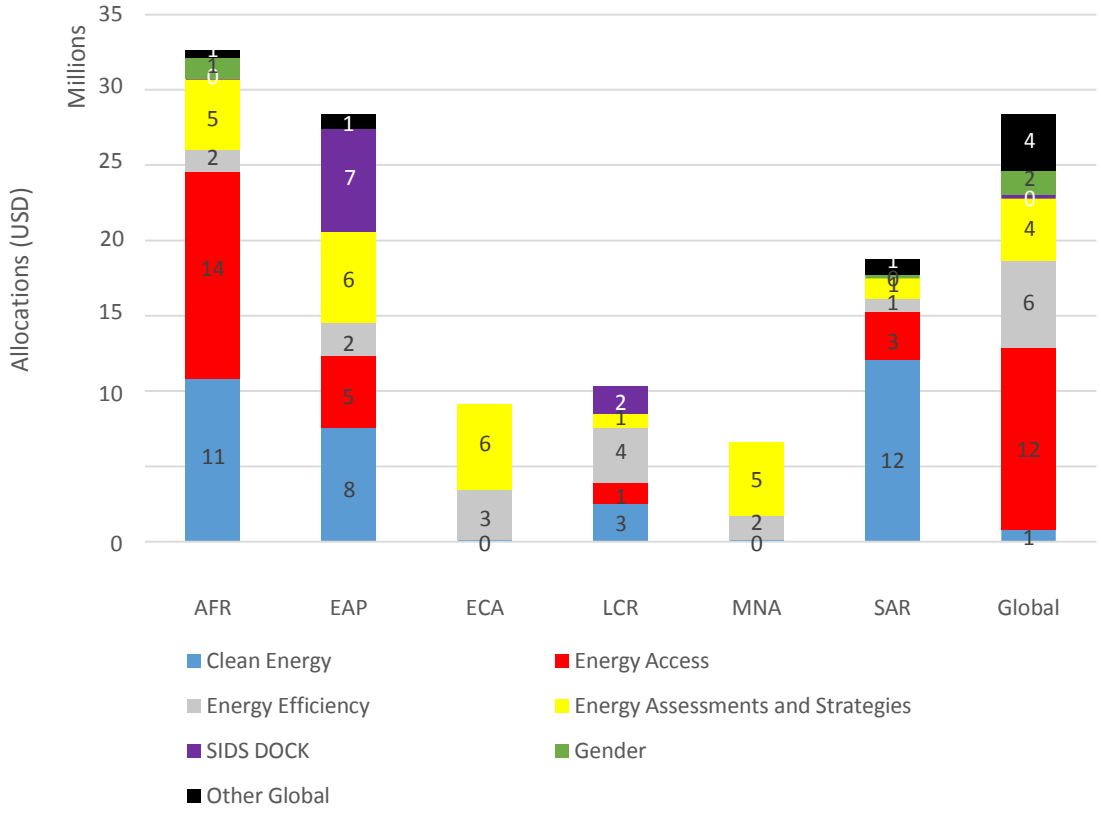
The SE4ALL Knowledge Hub Team presented the above Figure 1 to TAG. This dashboard shows that during the period 2012 to 2014 progress was too slow to meet the goals. In this context the

ESMAP programs can clearly be utilized by lenders and by governments to provide the analysis, policy and actions needed to accelerate progress. Additionally, the work of ESMAP in SE4ALL tracking serves as key credible benchmarking across the global community around progress on the SDGs, and particularly through joint engagement with the United Nations and National Statistical Bureaus on measurement and tracking. Countries that do not yet make their data available for this purpose should be encouraged to do so to help ensure the greatest accuracy in tracking and reporting of outcomes.

3.2 Inter Regional Context

It is noted that ESMAP, ASTAE and SIDS-DOCK activities in the FY14-16 business plan period were spread across regions as set out in the figure below, taken from the draft portfolio review for 2016.

Figure 2 | ESMAP (including SIDS Dock) and ASTAE Allocations by Region and Focus Area (USD), FY14-16



Source: ESMAP draft FY16 Portfolio Review.

Africa has received the greatest level of support, with energy access as the priority. Looking forward to the new business plan and the constraints that will arise from lower funding from donors, it is likely that there will be a continuing trend towards Africa. This would be in line with the priorities set out in last year's TAG discussions and recorded in Annex I of the ESMAP Annual Report 2016 that the first priority in a situation of constrained funding should be for energy access, followed by climate related activities.

3.3 Africa (AFR)

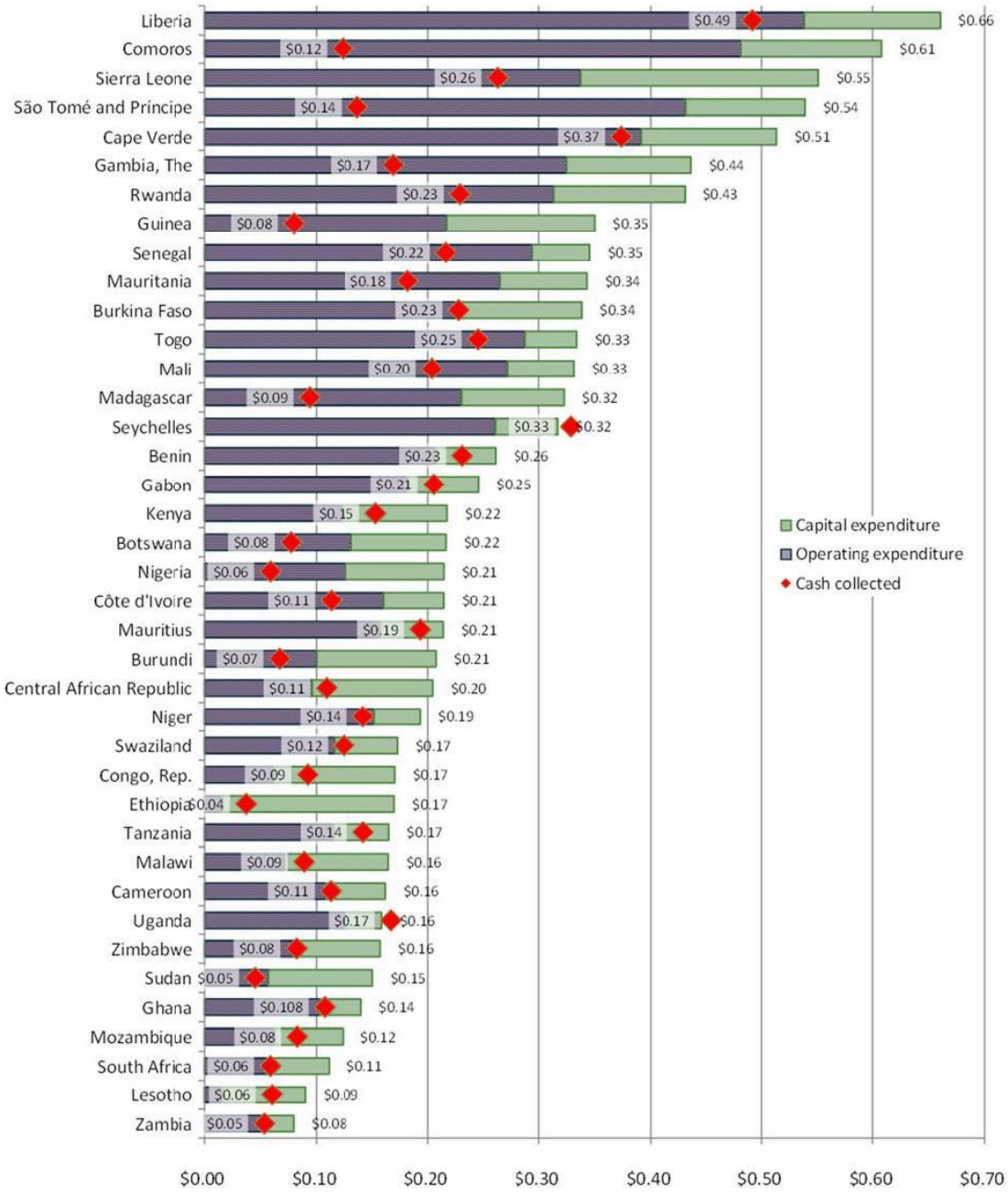
The analysis provided to TAG by the ESMAP Africa Program and the World Bank's Energy Practice Africa team highlighted the financial viability and operational competence of utilities as the "foundational" challenges underpinning the difficulties of meeting the aspirations of universal access to modern energy, and the need for security of supply to support economic growth. The constraints apply to utilities and their grids, and in theory an off-grid or mini-grid program should

be able to progress separately. Indeed this is what is happening primarily in rural areas where grid connections are seen as uneconomic. However, with urbanization trends on the one hand and the ambition of governments generally to maximize access through utility grids on the basis that they offer a better security of supply – a premise not generally justified by the evidence in much of sub Saharan Africa – the lack of an effective utility represents a major barrier to both access and security of supply. The problem of financial viability is summarized in the figure overleaf taken from Trimble et al (2016): "Financial Viability of Electricity Sectors in Sub-Saharan Africa", a Policy Research Working Paper of the Bank's Energy and Extractives Global Practice, financed by ESMAP.

The paper assumes a standard level of capital investment needing to be recovered. The grid expansion plans of a number of sub Saharan countries imply significantly higher levels of capital expenditure which may prove impossible to recover from customers if economic growth remains low, and any increase in demand is delayed. The paper notes that the shortfall is equivalent to 1.5% of GDP if met through the fiscus: one approach across sub Saharan Africa is to keep customer tariffs down by utilizing multilateral or bilateral loans to government instead of private sector investment. Indeed the private sector has no real market to supply, and therefore seeks to bypass and weaken any embryonic market by carving out a protected position thorough credit support from government.

The shortage of cash from utilities leads to liquidity problems where there is private sector investment to be paid through some form of market structure, while it also leads to the failure to develop human capital needed for the effective operation of the utility and its networks. The efforts to "reform" electricity sectors over the last 20 years have had little impact in terms of creating sustainable grid utility businesses. It is noted that two ESMAP activities ongoing at 30 June 2016 have begun to consider the implications of this analysis: "Rethinking orthodoxy on power sector reform" under the ESMAP Annual Block Grants (covering all regions, not just Africa), and the "Energy Subsidy Reform Assessment Program" under the energy subsidy program. At this stage, however, these activities generally address one or more of the issues rather than presenting an overview for any one country of the range of underlying issues which result in the lack of financial viability. In addition the analysis in the research paper suggests that there is a need to reconsider the real economics of large scale access utilizing the grid, especially for the urban poor where the combination of low tariffs, low collection rates and low demand is likely to aggravate the problem of utility financial viability and even put upward pressure on tariffs for other customers, leading to a detrimental effect on economic growth.

Figure 3 | Utility Costs versus Cash Collected, 2014



Source: World Bank staff calculations based on utility financial statements and other documents.

3.4 Asia – South and East (SAR and EAP)

These two regions received $48m in grants from the combination of ESMAP, ASTAE and SIDS-DOCK in FY14-16. This is in the context that the combined regions have over 50% of the world's population, and rapid economic growth is driving increases in energy demand, much of which is being met by new fossil fuel generation, notably coal. While access is the key issue in Africa, and is still a major challenge in parts of Asia, clean energy is also a major issue in these two regions, and this is reflected in the expenditure in FY14-16.

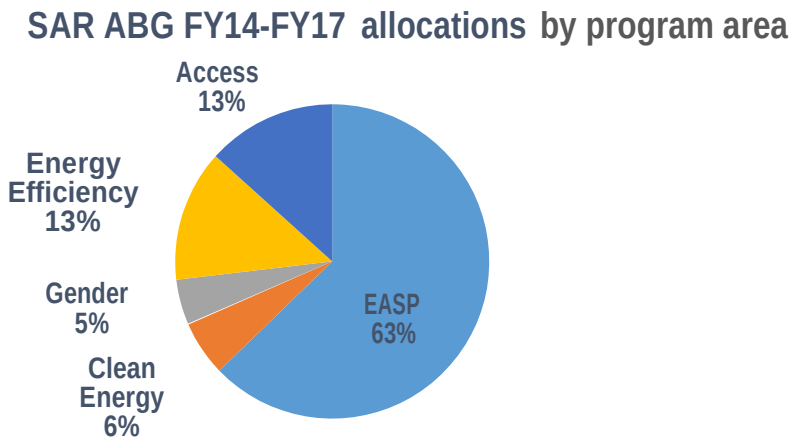
The areas identified as priority by South Asia are:

- "Energy sector planning and strategies
- Climate change and energy transitions: follow-the-carbon, India and Pakistan key

- Achieving access goals: From remote off-grid to peri-urban households
- Energy-water nexus: Need for integrated approach
- Regional interconnectivity: Maintaining momentum, scaling up from pragmatic bilateral exchanges."

In FY14-17 to date the annual block grants (see figure below) have been spent primarily on energy assessments and strategies, with only 6% on clean energy, since that is mostly funded by global programs. The above priorities indicate that the bias in future is likely to move towards renewables to help counter the impact of the rapid growth in fossil fuel generation.

Figure 4: | South Asia Region Use of Annual Block Grants

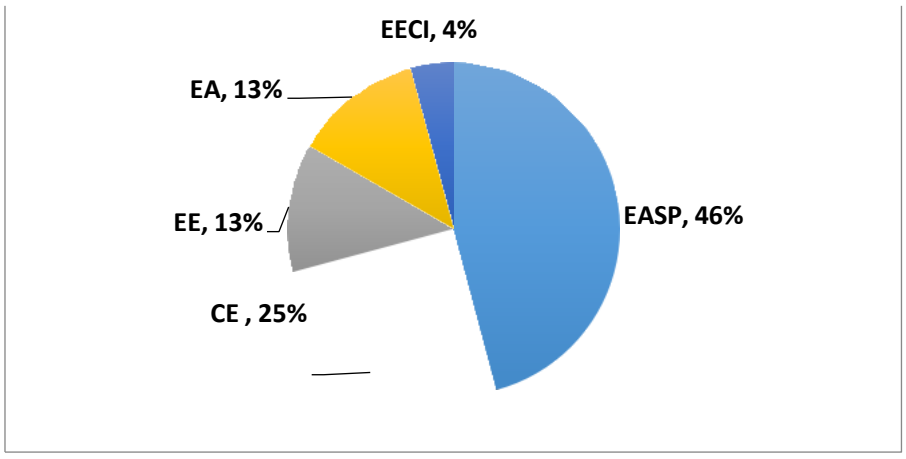


Source: World Bank SAR Practice presentation to TAG.

The current annual block grants cover four activities in India, one in Bangladesh and one in Afghanistan.

In East Asia and the Pacific (EAP) the use of annual block grants in FY14-17 has a greater clean energy component:

Figure 5 | FY14-17 ABGs in EAP



Source: EAP presentation to TAG.

In terms of countries the largest proportion (32%) went to China, but the second largest (18%) went to Myanmar.

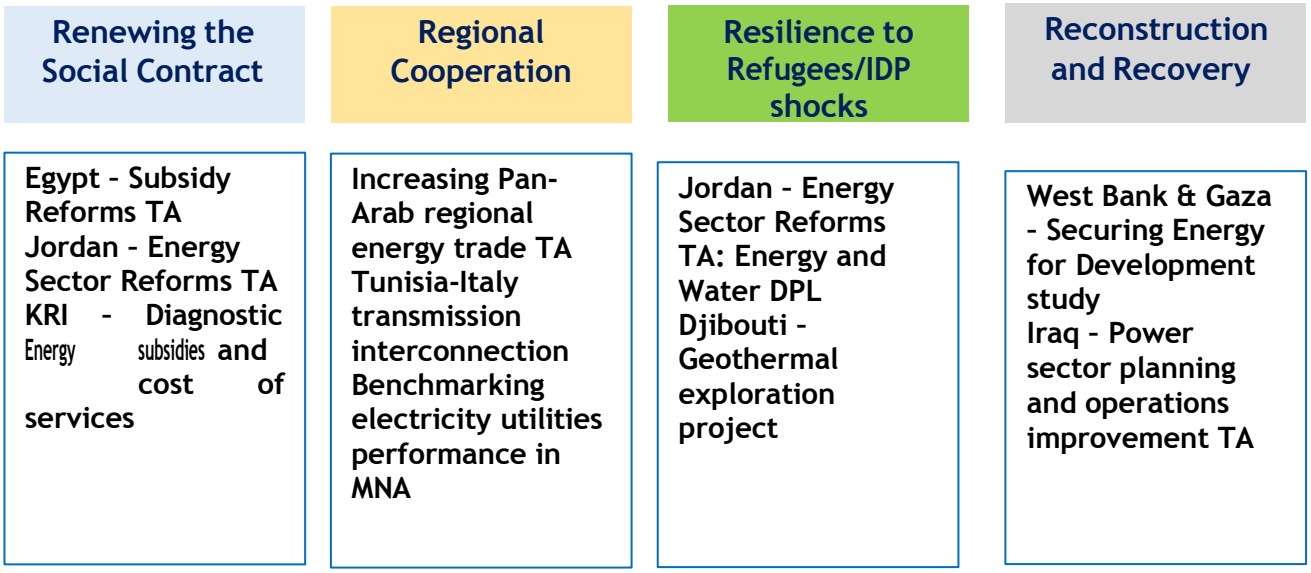
Clearly the winding down of ASTAE will have an impact on programs in South and East Asia. There are insufficient funds available to ESMAP to enable grants to these regions to continue at the same level. It is noted that the ESMAP allocation to the two regions in terms of ABGs in FY17 is nevertheless still 31% of the total. Also the priorities recommended by TAG in last year's report will inevitably lead to a reduction in allocations to Asia compared with Africa where the main problem of energy access exists, albeit recognizing that access does remain a key challenge for a number of Asian countries.

3.5 MIDDLE EAST AND NORTH AFRICA (MNA)

As presented by the Middle East and North Africa Energy Practice MNA represents a very particular set of challenges linked to the fragile and conflict ridden status of a number of the countries, plus the need for major economic restructuring, much of which has linkages to the energy sector. The current ESMAP programs clearly contribute strongly to MNA priorities: subsidy reform, sector reform, the need to diversify the energy matrix and move towards renewables, opportunities for regional trading and cooperation and planning for reconstruction or resilience.

While the region had the lowest allocation of ESMAP funds in FY14-16 it is clear that ESMAP activities made a significant contribution in terms of support for projects and in facilitating significant lending programs. The ESMAP support is summarized by MNA in the following figure:

Figure 6 | MNA Energy Team Analysis of ESMAP Support



It is noted that a number of the above activities could have wider application in terms of lessons learned. This includes a wider view of the impact of subsidies, new lessons re. the reform process and making it effective, and the idea of benchmarking utilities.

3.6 EUROPE AND CENTRAL ASIA (ECA)

The World Bank ECA energy team highlighted the importance of ESMAP in the areas of "reliable, efficient, affordable and sustainable energy supply". There is continuing need to support reform programs and regional markets, to support the financial recovery of utilities and to support increased uptake of renewables and energy efficiency measures. While there are generally no issues re energy access in principle, there are increasing concerns regarding the need to finance the replacement of aging energy infrastructure: the investment need to 2030 is estimated at $3.3 trillion. It is important to ensure the replacement of old generation with cleaner and renewable technologies.

Taking into account heat demand in the region during the winter and energy need for cooling during the summer the region is the most energy intensive. The first need is to reduce demand by introducing energy efficiency actions, as well as to increase access to clean and affordable cooking and heating options.

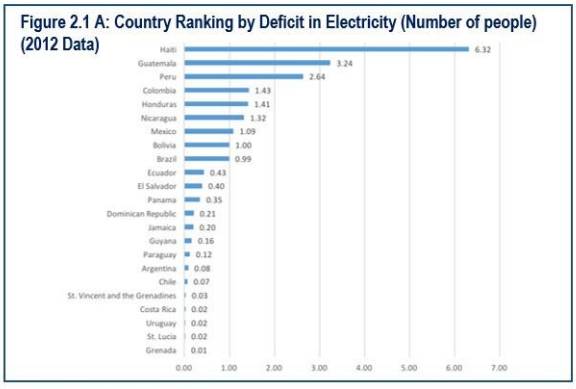
At 30 June 2016 ECA had 29 activities in progress under ABGs, the highest of any region, and ESMAP produced more than 70 outputs for the region in FY14-16, costing $9.1m. The majority of these came under the heading of energy assessments and strategies, and it is clear that the reform process has achieved more in ECA than in Africa, for example. However, there is continuing strong demand for analysis to support future lending and investment, and it is not clear to TAG members whether the current reform process will actually enable the full level of commercial and public investment required. There will still be lessons to be learned as to how to establish the financial viability of the utilities within the context of a political economy, especially as a basis for securing investment for the major asset replacement and enhancement program.

3.7 LATIN AMERICA AND CARIBBEAN (LCR)

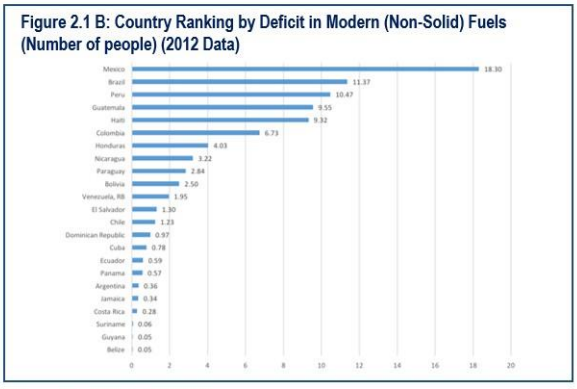
The presentation made by the LCR energy team focused on the contributions that ESMAP could make to a re-definition of utility and energy supply models across the region in the coming five years, while highlighting the energy efficient cities project in Mexico and the climate/system resilience activity in Belize.

In terms of access to modern energy the challenge in Latin America and the Caribbean can be narrowed down to a small number of countries, most notably in Haiti.

Figure 7 | Electricity Access and Modern Energy Access Deficits in Latin America and the Caribbean



Source: World Bank, IEA (2015).



Source: World Bank, IEA (2015).

It is noted that the efficient cities activity – originated in Armenia – can have wider application in many of the countries now reaching middle income status, whether in Latin America or Asia.

The reform process has proved successful across this region although there are countries where it has not always functioned fully. Private sector investment in the electricity and natural gas sectors now consistently exceeds government funded investment and has done since 2009. Reliance on fossil fuels for electricity generation is an issue, especially given the availability of low priced coal from Colombia.

4 STOCKTAKING OF ESMAP

4.1 FUNDING AND FY14-16 ALLOCATIONS

Please note that the analysis undertaken by TAG does not seek to replicate what is presented in the ESMAP Annual Report or the draft Portfolio Review. The funding and allocation of ESMAP funds over the FY14-16 business plan is set out in the table below.

Table 1 | ESMAP Funding and Allocation to Projects FY14-16

ESMAP Program	Available balance* on	Funds received from donors**	Funds allocated to projects*** in	Available balance on
	$m	$m	$m	$m
Total	**28.5**	**113.1**	**123.1**	**18.5**

Source: ESMAP.

*Balance in ESMAP MDTF as of the end of FY13. MDTF is a Multi-Donor Trust Fund, or a Trustee Fund, or a Parent Fund to which donors are contributing. This represents the balance received from donors. This balance includes funds available for allocations as well as funds that have already been approved for allocations but, as of July 1, 2013, not yet transferred to projects (to Child Trust Funds).

**Contributions from donors received to ESMAP MDTFs from July 1, 2013 through June 30, 2016

***Funds approved AND transferred to projects from July 1, 2013 through June 30, 2016

Over the business plan period funds allocated have exceeded funds received, resulting in a lower balance carried forward at the end of the period. However, the table below, which sets out allocations and disbursements by program, indicates that disbursements lagged allocations and that there was a balance of grant allocated but not disbursed of $55.4m at the end of the business plan period. 40% of the grant balance is accounted for by contractual commitments. The largest disbursements have been by ABGs, Renewable Energy Mapping and AFREA, while the largest grant balances after deducting commitments are for Green Minigrids, Subsidy Reform and City Energy Efficiency. Grant balances include allocations covering the full period of the new business plan, for example on Green Minigrids.

Table 2 | Grants and Disbursements by Program FY14-16

	$m	$m	$m	$m	$m	$m
Total	**10.8**	**123.1**	**78.5**	**55.4**	**22.1**	**33.3**
ABGs			17.1	5.5	2.7	2.9
SE4ALL			8.5	5.2	2.5	2.7
Green Minigrids			0.4	6.1	0.5	5.6
SE4ALL Knowledge Hub			3.2	1.5	0.3	1.2
State of Energy Access Report			1.8	0.6	0.3	0.4
ECCH			0.6	1.6	0.1	1.4
Access Urban Poor			1.1	0.9	0.3	0.5
AFREA			10.1	6.0	2.6	3.5
Geothermal			2.9	2.4	0.3	2.0
RE Mapping			10.5	12.0	10.4	1.6
Clean Energy TA			1.5	0.0	0.0	0.0
Climate Resilience			0.5	0.1	0.0	0.1
Subsidy Reform			5.4	5.8	1.1	4.7
Sector Planning			1.0	0.2	0.0	0.2
Nexus			0.4	0.1	0.0	0.0
City Energy Efficiency			5.8	4.6	0.9	3.7
Energy Efficiency Support			0.6	0.0	0.0	0.0
Gender			0.9	0.3	0.0	0.3
RBF Approaches			0.6	0.1	0.0	0.1
PMA			2.7	2.5	0.0	2.5
M&E			0.9	0.0	0.0	0.0
Communications			1.5	0.0	0.0	0.0
Others			0.4	0.0	0.0	0.0

Source: ESMAP.

*Grant balance refers to funds that have been allocated from the ESMAP MDTF (Trustee Fund or Parent Fund) but have not yet been disbursed as of July 1, 2013. Grant balance includes contractual commitments (Purchase Order=PO Commitments)

**Funds approved AND transferred from ESMAP MDTF to projects from July 1, 2013 through June 30, 2016

***Funds that ESMAP Task Team Leaders (TTLs) has actually spent on their projects from July 1, 2013 through June 30, 2016

****Purchase Order (PO) Commitments are contractual commitments as of June 30, 2016

Disbursements[1] averaged $28.2m per annum, but the trend is for increasing disbursements over the period, with $21.8 m in FY14 $26.8m in FY15 and $36 m in FY16. It is noted that the budget for allocations in FY17 is $35m and therefore in line with disbursements in FY16. The subsidy reform program includes the following activities with significant unspent allocations at 30 June 2016:

- Subsidies and tariff reform in Iraq: $803k, due to complete April 2017, and only $120k is still undisbursed at the end of February 2017.
- Advancing subsidy and tariff reform in Ukraine: $646k, due to complete April 2017, and only $77k is undisbursed at the end of February 2017.
- Subsidy reform knowledge products: $594k, due to complete August 2018, and only $150k is unspent at the end of February 2017.
- Safeguarding the poor and vulnerable: $509k due to complete December 2017, and $311k is undisbursed at the end of February 2017.

Therefore it is evident that these major activities are on schedule.

4.2 FY16 ACTIVITIES AND OUTPUTS

In FY16 ESMAP initiated 84 activities (including 5 SIDS Dock activities) with a grant allocation of $30.4m (including $3.97m for SIDS Dock) according to the draft Portfolio Review. This compares with an indicative budget allocation of $36.1m for ESMAP only (which includes management and related functions with a budget of $2.2m) established at the beginning of FY16. Ongoing activities at 30 June 2016 totaled 92 with an allocation of $73m per the draft Portfolio Review.

171 outputs were reported for FY2016 with 106 based on analytical studies[2] and 65 on knowledge products. Individual outputs typically focus on informing clients or on capacity building, and TAG is pleased to note ESMAP is seeking to assess how it influences decisions rather than just providing outputs.

4.3 OUTCOMES

The ESMAP Annual Report cites ESMAP (including SIDS Dock) grant allocations of $118m in FY14-16 influencing $3.7bn of World Bank lending, with further leverage of $1.8bn from partners. On ABGs it cites $1.2bn of World Bank lending influenced by ESMAP allocations of $9.8m. In FY16 alone, ESMAP influenced World Bank funding of $1.3bn, down a little from FY15 ($1.6bn), while leverage from partners totaled $0.4bn in FY16 compared with $1.3bn in FY15. However, the FY15 results were impacted by one large project in Egypt with World Bank lending of $500m and leverage of $974m.

The projects with the targets non-Bank leverage were in China and Ethiopia and involved Government contributions. Outcomes at this stage of the project cycle relate to the targets of projects as actual outcomes are not known and will depend on implementation.

TAG notes the increased cooperation with IFC with particular reference to Lighting Africa, Lighting Myanmar and potential partnerships on energy efficiency services and renewable generation. There

[1] ESMAP excluding SIDS Dock and ASTAE

[2] Advisory Services and Analytics (ASA) are discrete and programmatic non-lending activities of the World Bank that help its external clients or audiences to attain a specific development objective. ASA can either be stand-Alone activities or a complement to lending programs. They typically aim to help clients adopt better policies, implement reforms, strengthen institutions, build capacity and inform development operations.

will always be limits to this cooperation, notably when the outcome of a project is likely to be a competitive tender process.

4.4 FY17 INITIAL STOCKTAKING

The initial budget allocation for ESMAP programs and activities in FY17 is $35.4m and in the first eight months of FY17 allocations for grants are reported as $13m and disbursements against this budget are $4.3m. The allocation compares with funds received to date from donors of $30.5m ($29.4m was received in the first six months of FY17). Unless donor funding increases the buffer of unexpended allocations and unallocated funds will reduce and from FY18 there is likely to be a reduction in the level of ESMAP activity. This scaling back is in addition to the end of the ASTAE funding stream.

The table below sets out the budgets, grants, disbursements and commitments for the period from 1 July 2016 to 28 February 2017. As noted above the grant balance brought forward at 30 June 2016 may not be allocated to a single year's budget allocation and disbursements against grant allocations from previous years are not included.

Table 3 | Progress against FY17 Budget as at 28 February 2017

Program	FY17 Budget	Budget for Grants	ACTUAL ALLOCATIONS FOR GRANTS	Budget for Own-Managed Work (such as coordination, knowledge, operational support)	Disbursements in FY17 YTD	Commitments
Annual Block Grants	7.00	7.00	6.02	0.00		
SE4ALL Knowledge Hub	4.00	0.00		4.00	1.56	0.81
Energy Subsidy Reforms	4.00	3.13	0.51	0.87	0.24	0.13
Efficient Clean Cooking & Heating	2.00	1.50	0.80	0.50	0.13	0.02
SE4ALL Technical Assistance	2.00	1.60	0.58	0.40	0.00	0.00
Mini-Grids	2.00	0.50	0.35	1.50	0.68	0.87
Urban Poor	1.00	0.50	0.11	0.50	0.15	0.36
RE Mapping	2.00	0.80	1.32	1.20	0.14	0.50
Global Geothermal Development	1.00	0.40	0.07	0.60	0.35	0.25
VRE Grid Integration	2.00	1.60	0.52	0.40	0.09	0.00
Solar Program:						
Solar Support Program	1.00	0.75	0.56	0.25	0.03	0.00
Lighting Global	1.00	0.70	0.00	0.30	0.00	0.00
Efficient and Sustainable Buildings	2.50	1.90	0.87	0.60	0.03	0.05
EE Project Preparation	2.00	1.50	1.32	0.50	0.29	0.04
Program Management and Admin	0.75	0.00		0.75	0.30	0.10
Communications	0.50	0.00		0.50	0.28	0.10
KM	0.25	0.00		0.25	0.01	0.00
M&E	0.25	0.00		0.25	0.01	0.00
	35.25	**21.88**	**13.01**	**13.37**	**4.28**	**3.22**

Source: ESMAP.

4.5 RISK MANAGEMENT

4.5.1 Current Risk Measures

The ESMAP financial data includes the rating of activity risks by two factors: disbursement rate and implementation rate. Disbursement rate is simply disbursed divided by grant allocated, and low disbursement rates are highlighted (although this may just be that an activity has only recently commenced. Implementation rate is disbursement added to contractual commitment divided by the grant amount. At program level implementation rate is disbursement plus commitment divided by fiscal year budget allocation. The draft Portfolio Review presents these rates for the ABG programs only. As measures of risk these are only indicative even at activity level, and TAG would expect that there would be a clear cross reference to elapsed time rather than just execution rates in order to highlight the higher risk activities: this would improve the assessment of time and, to an extent, cost risk while there would need to be separate review processes regarding quality risk.

TAG reviewed briefly the activities showing a risk marker under the disbursement and implementation rate measures. In the sample around 25% of activities met the risk criteria, but the majority of these were simply recently mobilized activities.

4.5.2 Risk Matrix

ESMAP is developing through its strengthened M&E function a risk framework, covering strategic risk, operational risk and financial risk. The risks are defined as they relate to ESMAPs position and role, and it may be appropriate to consider both the wider strategic risks that will affect the impacts and outcomes anticipated by donors from ESMAP's activities, as well as the more specific performance risks when looking at the operational level.

One option would be to look at the key strategic risks at regional, country and sector level associated with Bank projects that will impact ESMAP's work (say financial viability of utilities, lack of an effective role for private investment, risk of political unrest), and then to cascade these down to individual proposals for activities, so that an overall external risk rating can be determined at the proposal stage. TAG would expect ESMAP programmatically to have a range of risk levels in its activities with a reasonable proportion carrying high risk (fragile states, difficult political economy). The risk evaluation can then be considered also in activity planning and in ongoing quality assurance of activities.

Operational risks should focus on the three issues of time, cost and quality at both program and activity level, while recognizing that each may be affected by external strategic risks that materialize. Quality should include checks that the activity meets both client needs and makes progress on steps towards the overarching end goals of energy access and clean energy, as well as ongoing quality assessments of the standard of inputs (consultant quality) and outputs. If there is a risk that the activity or program will not reach the appropriate targets (gender, vulnerable households, new economic growth) then that should be considered upfront. After the initial risk assessment, risk management is a part of the quality assurance process at activity and program level.

The financial risks identified in the proposed risk matrix solely relate to the funding programme, and as such not directly cascade down to program and activity levels unlike the strategic/external risks and the operational/performance risks. It may be useful to consider these risks alongside a view of the overall funding and grant allocation process so that the risks can be defined as more specific than generic. In addition the risk that funds provided are utilized wastefully or inappropriately: mitigations will generally be generic (procurement processes, use of benchmarking, anti-fraud measures) but they apply at each level.

As the risk matrix is developed it is recommended that the evaluation process is refined so that at each level (portfolio, program, or activity) the two elements of any risk – impact and probability – are assessed at least qualitatively, and that these are evaluated both before mitigations and after mitigation (when they should of course be reduced).

A specific area of risk for ESMAP relates to its role as a "convener", providing the strategic analysis and knowledge that can form the basis of interventions by a range of donors, not just the World Bank's lending operation. Donor alignment in any country or program can always be problematic, and it may be that the issue can be addressed through the risk matrix at program and activity level – alignment behind an agreed understanding and coordination at the operational level.

It is understood that there may be concerns that additional risk management reporting will be seen as bureaucratic and onerous. Design of the framework and its cascade down to activities is important, but otherwise the process should only reflect natural risk management behavior by activity leaders and reviewers. At program level the risk management framework could dovetail with the Bank's project level risk.

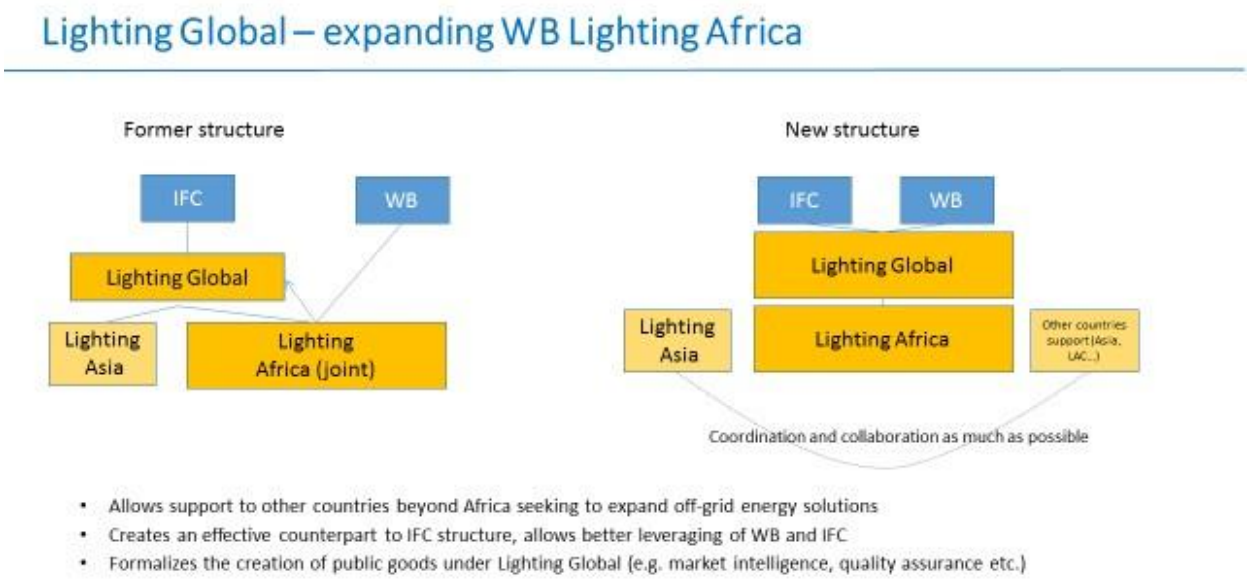
5 PRIVATE SECTOR FINANCING

The global agenda of climate change mitigation and adaptation requires significant effort in terms of policy action and finance. International financing institutions are often unable to meet demand in certain countries. At the same time many countries have limited borrowing capacity and are unable to leverage funds from IFIs. Private sector engagement in sustainable energy financing is critical to achieve both the SDGs and climate goals. Renewable technologies in and of themselves are not considered a barrier for private investors given the proven advantages of solar, wind, hydro and even geothermal resources used for energy production. However, investment requires not only promising renewable resources but also long term sustainable policy, legislative and institutional stability, and certain guarantees in target countries. In other words, they need a favorable enabling environment. To support countries with the investment climate the World Banks helps governments through the activities of ESMAP. It includes legal, regulatory and institutional improvements, resource assessment and feasibility studies, social/gender and environmental assessments of projects, training and capacity building activities. There are also instruments produced under ESMAP initiatives that can be used directly by the private sector. Although the indirect impact of ESMAP on investments with private sector financing may be significant and crucial, ESMAP reports only the projects where the WB operations are co-financed by private sector companies (with the specific investment mentioned in the financing plan of the project). The Portfolio Review FY2016 mentions two activities of ESMAP that leveraged private co-financing: i) Egypt Gas Regulator Capacity Building (the WB Project Household Natural Gas Connection Project) with $326 million leverage; ii) the Armenia Financial Recovery of the Power Sector (ESMAP support was $60,000 and leveraged $10 million from private sector as co-financing to the WB Power Sector Financial Recovery Program. The TAG recommends ESMAP to report also on the indirect support to and from the private sector in forthcoming portfolio reviews. The new monitoring framework may provide such platform.

During FY 2016 closer cooperation between ESMAP and IFC was established through transfer of knowledge and information and provision of specific tools and resources developed under ESMAP. Given the limited budget of ESMAP and the availability of the IFC's own budget for advisory services, the cooperation between ESMAP and IFC should be limited primarily to knowledge exchange and joint activities in capacity building. IFC has access to all products generated through ESMAP. One such product launched during 2016 is the Global Solar Atlas, which provides in user- friendly mode the data and information about solar resources all over the world. A good example of cooperation

between ESMAP and IFC is Lighting Africa, a joint World Bank and IFC program. Started in 2008, it aimed to support market transformation from expensive, polluting and harmful fossil fuels to modern quality solar lighting products. ESMAP was the main financier on the World Bank side. Initial TA pilots are now mainstreamed into IDA operations – e.g. IDA-financing in Ethiopia has led to modern energy services for 750,000 people in less than 18 months. Over 15 million Africans benefiting from basic electricity access with Lighting Global-certified products. Operations are ongoing in 12 countries. The program has also extended its geographic scope from "Lighting Africa" to "Lighting Global" to engage other countries as well. Another example of the ESMAP support to IFC operation is activities related to the Global Knowledge Platform of the IFC's EDGE (Excellence in Design for Greater Efficiencies) Green Building Market Transformation Program. This is on-going activity started in 2015 and showing impressive results: EDGE certified 880,000 m^2 of floor space in developing countries, 43 million kWh in energy saving, 800,000 m^3 in water saving, 7 million MJ in material saving annually. ESMAP continuous support aims to upgrade the tools, add new products (e.g. EDGE calibration for Chinese market and link to local certification system) and to extend support to new countries and new markets.

Figure 8 | Lighting Global Structure Change



Among other products that are highly important for private sector engagement is the Regulatory Indicators for Sustainable Energy report (RISE), since it presents the countries' attractiveness for private investments. At the same time, it motivates countries to improve their enabling environment. A second one is RE resource assessment/mapping. Site specific, ground measurement efforts are most valuable for countries and private investors, since these are among the main risk reducing/mitigating factors. Variable Renewable Energy (VRE) allows the removal of barriers to investment in grid-connected generation. Clean cooking opens a larger market for private manufacturers and suppliers. Energy Efficiency (EE) helps the ESCO sector to grow, bringing financial and professional inputs to global efforts to reduce greenhouse gas emissions.

While the scope for private sector investment in renewable energy for both off-grid and on-grid uses has been developed, significant constraints remain in the on-grid sector where the private sector could make major contributions to improving both access and the quality of supply. Private sector investment is almost entirely focused on electricity generation and there has been limited progress in transmission and distribution except in the few instances where privatization has been considered. Even where there is private sector participation in generation, this may serve in effect to block out a part of the market, and it can even increase risks in the rest of the sector where financial viability is already challenged.

Given the rapid urbanization in developing countries it is time to consider why existing approaches to on-grid supply have failed to attract private sector investment (and the associated operational efficiencies). The introduction of variable renewable generation at both the transmission and distribution levels will necessitate investment in networks, especially if they are to move towards more effective "smart" operations. It is difficult to see how the level of investment in modern and upgraded networks can in reality be financed without the involvement of the private sector. This implies a need for a re-think on what existing grid based utilities should be doing and how this might change. ESMAP is unusually well equipped to contribute to this: it may be that lessons can be learned from what is happening in middle income countries, and then the lessons could be considered in the context of low income countries with major issues of financial viability and capability in their existing utilities.

6 RESULTS BASED FUNDING

ESMAP initiated a Results Based Funding (RBF) program in 2011 to assess how, and under what circumstances, RBF can be used to improve outcomes and scale up financing for energy sector development. This cross-cutting work program includes three components: i) Analytical work and guidance on when and how to use RBF instruments in the energy sector; ii) Knowledge management and outreach to learn and share lessons on RBF programs and projects, including our development partners; iii) Operational support to country-based technical assistance projects to design and test out new results-based concepts and ideas.

During BP FY2014-16 the amount allocated for this program was $362,000. The approved amount is $360,446. No grant was allocated and approved in FY 16. The implementation rate for this activity of ESMAP is 99%, with an aggregated disbursement of $357,706 for seven outputs.

The main ongoing activity under the program is in Lao PDR, including background analysis and design of a health impact RBF mechanism for Clean Stove Initiative, for which $62,000 was allocated. The TAG recognized the importance of joint efforts with the Health GP to design a proper RBF scheme for clean cooking financing.

Although demand from client countries appears to be limited, the TAG encourages ESMAP to pilot additional RBF mechanisms under different programs of the new business plan, especially for clean cooking, albeit ensuring that results are not limited to installation of clean stoves and fuels, but should identify mechanisms to factor in ongoing usage, to ensure that outcomes are sustainable over time. TAG recommends closer cooperation with other organizations executing similar activities, for example the DFID-supported RBF program.

7 CROSS CUTTING PROGRAMS

7.1 ANNUAL BLOCK GRANTS FOR GOVERNANCE, MARKETS AND PLANNING

Annual Block Grants represents funding for the Global Practice regions for ESMAP support on a demand basis – in effect it is a demand driven facility. As at 30 June 2016 activities and grant allocation to those activities was as follows.

Table 4 | ABG Activities in Progress at 30.6.16: Number and Related Grant Allocation

	AFR	EAP	ECA	LAC	MNA	SAR
No. of activities	7	15	19	11	13	10
$000 grant	1,504	2,482	2,175	1,580	2,554	1,877

Source: ESMAP FY16 Financial Data.

Table 5 | ABG Grants and Allocation in FY16

FY16 ABGs	**AFR**	**EAP**	**ECA**	**LAC**	**MNA**	**SAR**
N. of grants activities approved in FY16	3	6	9	5	2	5
FY16 allocation ($000)	657	600	1,000	495	774	818

Source: ESMAP.

Table 6 | Allocation of ABGs to Regions as at February 2017

FY17 ABGs	AFR	EAP	ECA	LAC	MNA	SAR
FY17 ABG envelope ($000)	3,382	1,119	1,243	1,053	1,104	1,107
Approved allocation as of Feb 28 ($000)	1,853	689	1,198	860	919	450

Source: ESMAP.

From the above it is noted that the highest FY17 ABG envelop and allocation to date has been to Africa.

This includes unallocated resources from the AFREA program that have now been transferred as ABGs to Africa region in FY17 (per ESMAP FY17 Financial data supplied to TAG and per ESMAP FY17-20 Business Plan).

Not surprisingly, given the demand driven nature of the activities and the differing requirements of countries, the range of issues supported by ABGs varies greatly. The examples provided to TAG by the Governance, Planning and Markets team suggest that the main areas of activity are on reform, followed by power system planning, with market development the area with the lowest level of activity. Examination of activities in progress at 30 June 2016 suggests that sector strategies and reform programs are the subject of most activities in Europe and Central Asia, building on existing partial reforms, while the issue of energy and electricity markets is mostly confined to East Asia.

The GPM team reported as a comparative ESMAP advantage the "long-standing record of engagement with countries on energy sector-wide assessments", but discussion indicated that this concept is not clearly defined and was interpreted differently by the Africa team for example. Given

that a major risk in the delivery of SDGs is the financial viability of utilities and their scope for providing access to even the full urban population, there is scope for taking a wider but better defined view of what can be offered, covering the whole energy system for any country. Elements that could be incorporated include:

- Real economics of grid utilities – tariffs, subsidies, cross-subsidies.
- Financial viability of grid extensions compared with current lower costs of off-grid options for the poor.
- Extending system planning into system optimization, system and market operations and power procurement strategies. The commercial and market aspects of system integration are not covered within ESMAP.
- Definition of the operational weaknesses in utilities driven by their lack of financial viability.
- Defining the costs of poor reliability of supply and its impact on economic growth.
- Defining hidden barriers to private sector investment (not just the "credit worthy off-taker" issue which can be a means of blocking out the market and preventing effective market development).
- Political economy factors inhibiting progress on access and security of supply, despite political aspirations.

It is suggested that a clear definition of the "sector-wide assessment" product could allow Bank country managers and the Energy Global Practice to target specific countries where the barriers to improved access and security of supply are particularly large. Such analysis could then lead to a re-definition of the role of the incumbent utility and the role of the off-grid sector. In turn it may drive the reform process from a separate set of objectives compared with the historical position where reform is seen as an objective in its own right, but one that can readily be undermined by vested interests.

7.2 Energy Subsidy Reform and Delivery Technical Assistance Facility

It is noted that energy subsidy reform activities have focused largely on fossil fuel subsidies, and on the mitigation and communication of impacts on the population affected. In general the countries supported in FY14-16 were middle income (exceptions are Haiti and Madagascar) with a bias towards Europe and Central Asia. The Subsidy Reform team reported to TAG that 46% of their activities related to the ECA region, with only 6% for Africa and South Asia. It is, however, noted that an output in the first quarter of 2017 will be a study on African power utility tariffs and household affordability.

Activities have focused on countries where there is a clearly identifiable fiscal impact (e.g. Egypt, Ukraine). Clearly lessons can be learned from these activities and applied in other countries.

In the context set out above in this report the issue of the financial and operational viability of utilities was raised, with specific reference to low income countries in Africa (although it can equally apply in other regions). Tariffs and subsidies are critical elements of the problem of viability, and also provide information regarding the operational implications and weaknesses. There are a number of factors involved, not just the level of tariffs or the payment (or otherwise) of subsidies. The expertise in ESMAP as clearly demonstrated in the activities undertaken in the last business plan could be utilized in analyzing the fundamental problems of viability and the economics of grid extension

compared with off-grid access to electricity. Additional issues that effective tariff analysis can help inform are:

- Hidden fiscal subsidies such as utility capital provided from government budgets, or funded by multilateral or bilateral loans, and not recovered through tariffs.
- Cross subsidies between customer classes, leading to supplies being non-viable to smaller residential customers or new residential connections, while resulting in uncompetitive tariffs for businesses.
- Impact of over ambitious or inaccurate assumptions on demand, leading to inadequate revenues and stranded costs from private sector power purchase agreements.
- Inefficient power procurement strategies.
- Hidden system optimization costs, such as curtailment of government owned plant.
- Relative economics of on-grid and off-grid connections, especially for the urban poor.
- Implications re operational inefficiencies and lack of capability.

The analysis that could emerge from this approach would also help donors prioritize their own activities. A subsidized new connection to a grid may be of little value if the ongoing supply by the utility is in fact loss making for tariff, collection or operational reasons.

7.3 SE4ALL KNOWLEDGE HUB

In 2016 ESMAP continued to support RISE, now re-named "Regulatory Indicators for Sustainable Energy," with the global rollout of this set of indicators outlining the legal and regulatory aspects in 111 countries, 90 % of global population, to support investment in sustainable energy in February 2017 (rather than in FY2016 as originally envisioned). A coordinated communications campaign across the Bank led to strong visibility, especially on social media, during the rollout of the RISE report. ESMAP has also continued to work on the State of Energy Access Report (SEAR) which, while delayed from FY2016, should be released in the coming months. SEAR will provide more in depth case studies on energy access to complement the data-rich GTF and MTF.

The TAG team recognizes the value of these core SE4ALL frameworks in supporting global tracking of progress towards achievement of the Sustainable Development Goals, and congratulates the team both on the wide consultative process undertaken in developing these products, including new alliances forged with regional UN bodies as well as the refinement of the products with each new edition.

8 ENERGY ACCESS

ESMAP's work on energy access during the business plan FY2014-16 continues to be informed by a range of global and national knowledge products and actions in support of Sustainable Development Goal 7 (SE4ALL) focused around rural electrification, the energy access for the urban poor, Lighting Global and mini-grids. It is notable that an increased focus on clean cooking and heating has led to the inclusion starting in FY2017 of this aspect of energy access as a focal point within ESMAP's programming. Early engagement is encouraging, as is the co-leadership with the Bank's Global Health practice to include a strong focus on addressing the health aspects of Household Air Pollution and the need therefore to strengthen the adoption of an appropriate range of clean stoves and fuels that can address these issues at scale affordably and sustainably.

Overall allocations FY2014-16: overall the largest allocation was for energy access in Africa from FY2014-16 (including AFREA). Disbursement rates were lower in FY16 than in previous years due to the 20 new activities started. In FY2016 five activities were completed and 18 were ongoing.

8.1 Efficient Clean Cooking and Heating Program

The clean cooking initiative has a strong vision for co-leadership and engagement with the Bank's health division, allowing opportunity to strengthen the case for clean cooking within the Bank, particularly given the recognized contribution of household air pollution to a range of serious health issues, and premature mortality.

TAG recognizes that despite attention in the sector over the last years, according to the Global Tracking Framework, progress to date does not keep up with population increase, and shows how much the sector lags still in terms of overall energy access.

TAG recognizes the challenges entailed in clean cooking, given the highly contextual nature of tailoring a combination of local preferences, affordability and increasing understanding in the sector of the types of solutions required to provide health benefits. TAG supports ESMAP's focus on clean stoves and fuels, incorporating a range of solutions and fuels tailored to context, while focusing particularly on being able to maximize health benefits, recognizing that affordability remains a major constraint, as well as limitations in the ability of many of the current generation of improved biomass stove models to reduce particulates to WHO recommended levels. In particular TAG notes ESMAP's work on "averted disability-adjusted life years" (ADALYs) with the Gold Standard as a measurement tool for impact in the cooking sector, as a way to reflect health impacts derived from clean cooking solutions.

Although it is recognized that health is generally not the primary driver at the consumer level driving purchase, it should remain a key focus for public sector interventions, particularly where subsidies are involved. Although not all of these interventions need to be led by ESMAP, it can help reinforce the need for public sector financing initiatives to focus across the supply chain (to determine what options are available nationally that can be reasonably scaled, and what options are acceptable to consumers) and focus on the cleanest stoves and fuels that maximize health benefits at acceptable cost, while also not contributing to increased deforestation.

In order to help support the scale required to meet the targets in the GTF, a combination of both rural and urban/peri-urban solutions will be required, given the size of the challenge, ongoing urbanization and the need to support adoption of solutions in both settings. The ESMAP team can also foster a nexus approach in this sector and work with colleagues working on electrification to explore whether increased access to power can in certain geographies or demographics can help to provide options relevant for cooking, through enabling consumers to utilize efficient appliances including electric rice cookers, pressure cookers etc. This approach is more applicable in a grid setting, or potentially a larger mini-grid setting, although peak load issues and affordability of electricity may be a challenge. In some contexts biogas can be scaled around existing agricultural practices.

TAG recognizes the opportunity as expressed by the ESMAP management to help harmonize the sector further through innovative financing approaches including Results Based Financing such as in the LAO PDR Gold Standard project (provided mechanisms exist to ascertain the stoves continue to be used over time) and the quality assurance and clear standards of what various solutions can and cannot provide. A parallel could be the same way Lighting Africa was able to provide clarity to the broader donor community on quality solar lighting products. It is recognized that this will take time

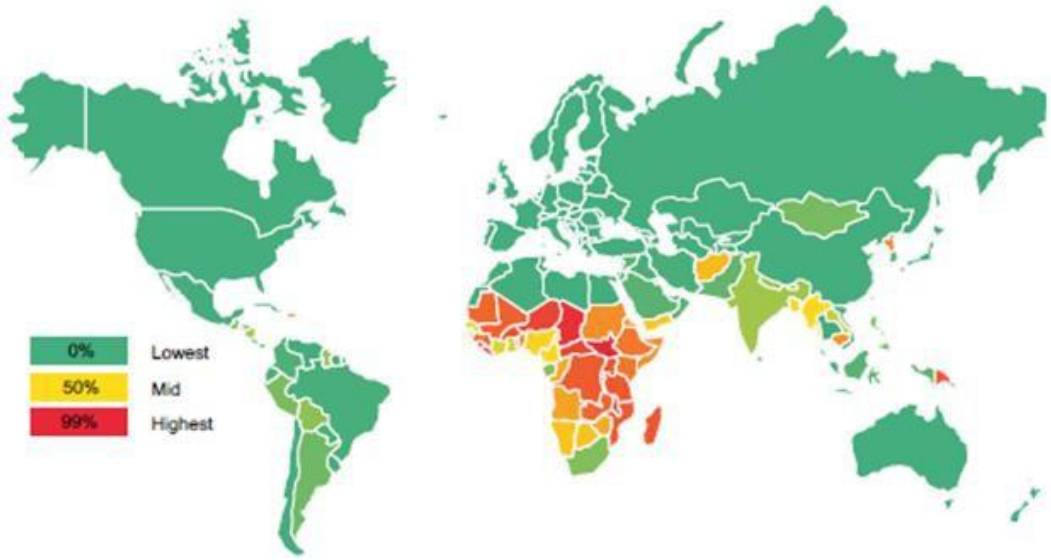
to develop, as will the potential to create leverage in terms of Bank financing projects. TAG also notes very early pilots are underway for a "Pay As You Go" (PAYG) approach to the adoption of clean fuels and stoves for cooking, particularly in the LPG sector. TAG encourages ESMAP to explore potential viability of such approaches, given the emergence over the last several years of PAYG as a scalable financing mechanism increasingly adopted by Lighting Global partners in the off-grid electricity sector.

While much of the focus remains on clean cooking, heating remains an energy access issue in some countries. In particular the clean cooking and heating team can continue work with the energy efficiency programs in ESMAP to evaluate ongoing potential for heating and cooking solutions, especially in the ECA region. The region is characterized as energy intensive due to the climate conditions and old infrastructure. Due to energy losses even the existing district heating becomes inefficient and expensive. Connection to the grid, district heating or a gas network does not always mean access to modern energy services. In many countries people heat their houses/apartments with liquid fuel, firewood or waste. Lack of access to clean and affordable heating causes diseases not only due to indoor pollution, but also accidents. Explosions, fires, and poisoning very often result in deaths. An especially dangerous situation is in multi-apartment buildings. In this circumstance in order to increase the access level the EE investments should be considered in line with provision of clean and efficient heaters to households to reduce heat demand. Although the energy efficiency investments require more effort than investments in infrastructure, the World Bank is committed to focus efforts on EE. TAG encourages ESMAP to continue activities directed to EE scale up in order to increase access to clean heating, to share experience from successful projects, to explore RBF for clean heating options as well as to support countries with policy recommendations to attract the private sector into this sector.

8.2 SE4ALL Technical Assistance Program

The ESMAP team presented recommendations that electrification can be improved by adopting sector wide programs and by applying least cost geospatial planning. The data provided indicates the need to focus on sub Saharan Africa.

Figure 9 | Share of population without grid access (% of total)



Source: BNEF, GOGLA, Lighting Global: Off-grid Solar Market Trend Report, 2016.

The approach set out in the presentation is sound and is strongly supported by TAG:

- "Electricity sector only (clean cooking now covered through a separate ESMAP program)
- Specific focus on low access countries (IEG recommendation)
- Objective: improve planning for universal access
- Expanded use of geospatial planning tools – focus on making government/utilities active users (longer term TA and maintenance support)
- Reduce costs and improve quality by standardization and more efficient procurement practices (e.g. framework contracts)
- Improve grid / off-grid interface (in planning in general and geospatial tools in particular) , usability of geospatial tools for private sector (e.g. off-grid companies)
- Differentiated levels based on needs – public tools based on available data – more comprehensive tools per country demand
- Data and tools in the public domain
- Investment Prospectus as means to funding mobilization and improved coordination - emphasize process and outcomes vs. a "report"
- Flexible funding based on successful implementation of phases
- Combination of global and country-specific activities"

Source: ESMAP SE4ALL TA Presentation

An important point, however, is that a sector-wide approach will need to cover more than just electrification costs; the viability of the operators, whether grid or off-grid needs to be considered and this may be a complex issue in low income countries as indicated in the sections on Governance, Planning and Markets and on Energy Subsidy Reform.

It is noted that the ESMAP team presented Kenya as a good example of the sector wide approach. There has been press coverage in Kenya of the fact that demand in East African countries is not rising as fast as expected despite the increase in household connections. Without a better understanding of how demand changes as new connections are made there is a risk that the geospatial analysis will prove misleading.

The most relevant factor here is that the least cost approach does not take account of the future profitability of the connection given tariffs, cross subsidies in tariffs, the risk of low consumption and the probability of the utility getting paid. The presentation cites examples from Kaduna and Kano in Nigeria: it is worth noting that current tariffs in Kaduna and Kano may lead to revenues below the cost of supply for most residential customers (large industry and commerce subsidize them), that the tariff regime assumes newly connected residential customers will use as much as long standing customers, and that many Nigerian cities suffer theft and non-collection problems from their residential customer base.

The ESMAP team is clear on the challenges that they face, which include realism, sustainability, grid to off-grid interfaces and the need to consider customer preferences. Historically customers have preferred grid connections as representing "strong" power, but improvements in off-grid reliability plus the problems faced by utilities in establishing a proper reliability of supply while also connecting large numbers of low consumption customers may mean that perceptions have to change.

8.3 GLOBAL FACILITY ON MINIGRIDS

The program is currently ramping up with two strategic pillars – meeting demand as requested by countries and establishing effective frameworks re technology, location and management processes that can help to scale up the utilization of mini-grids. Demand is proving to be high. TAG was

pleased to note that the ESMAP team was approaching the issue from the perspective of providing the most economic access to energy, and was open to hybrid options using renewables alongside batteries and variable speed diesel. TAG also notes the opportunity for ESMAP to explore utilization of some of the emerging energy storage chemistries that lend themselves to a "cradle-to-cradle" recycling approach, particularly in small island settings. Given the interest of a number of donors in the mini-grids area it was encouraging to note that the team is looking to build on donor cooperation. There should be an opportunity for ESMAP to exploit the “convening power” of the World Bank further too, building for example on prior mini-grids conferences convened with a range of partners in earlier years, as well as targeted national and regional workshops, such as one recently concluded in 2017 in Myanmar.

Given the falling costs of much of the technology including customer appliances, as well as the emergence of a class of "super-efficient" appliances, it is considered appropriate now for ESMAP to lead the way in looking at how the mini-grid approach can also be utilized where there are energy access and reliability problems associated with grid operations and the financial viability of utilities. This could be linked with development of the geospatial product in the SE4ALL TA team to incorporate a view on the overall economics of utility supply, rather than just the costs of connection.

8.4 URBAN POOR ELECTRICITY ACCESS PROGRAM

This is another new program that is just ramping up. The initial focus has been on looking at successful projects in India (Tata Power) and Latin America, but these are based on the existing utility being viable and having the capability to finance investment and social interaction to turn the households into utility customers.

Discussion between the ESMAP team and TAG highlighted the point that the best solution will vary between countries and even between utilities and cities within countries. There are potentially strong linkages between planning and markets, subsidies and tariffs, mini-grids and the resolution of successful energy access for the urban poor.

9 RENEWABLE ENERGY

In line with global developments towards adoption of clean and sustainable energy, the demand for investments in renewable energy in low and middle-income countries is continuously increasing. The Climate Investment Funds with MDB lending, the Green Climate Fund (GCF) and other carbon funding opportunities provide access to concessional funding. However, there are other barriers to remove in order to attract private sector and scale the usage of renewable resources. To support the World Bank operations and to facilitate private sector leverage, ESMAP has initiated several specific programs including the Global Geothermal Development Plan, Renewable Energy Resource Mapping, Variable Renewable Energy (VRE) Grid Integration Support Program and Solar Technologies Technical Assistance Program. The latter is specified as a separate program in the Business Plan for FY2017-20.

9.1 GLOBAL GEOTHERMAL DEVELOPMENT PLAN

ESMAP’s geothermal activities have helped establish an understanding in both governments and investors of the nature of the inherent risks associated with developing geothermal. It is noted that a number of risk mitigation mechanisms are now being developed, often with assistance from donors, to help improve the viability of projects whether developed by public sector agencies or private investors. There is now an increased interest in “hybrid” solutions with the private sector becoming involved at interim stages of development, e.g. after test drilling or as a steam supplier.

The Global Geothermal Development Plan (GGDP) was formally announced by the World Bank Group on March 6, 2013. The GGDP is an ambitious initiative by ESMAP and other development partners to transform the energy sector in developing countries by scaling up the use of geothermal power. The GGDP differs from previous efforts. It focuses on the main obstacle to geothermal expansion: the cost and risk of exploratory drilling. Validating the availability of commercially viable geothermal resources through drilling is an unavoidable step. It requires around 15% of the capital expenditure to be spent upfront, with no guarantee of return. GGDP's main objective is to mobilize concessional financing for this risky and expensive phase of geothermal development to catalyze investment in all other stages of the geothermal value chain. The success of the initiative is evidenced by the increase of geothermal financing to exploration by three times (for 6 MDBs) over 3 years. The leverage of public and private capital is over $1.5 billion according to estimates, and this will increase if the "hybrid" solutions outlined above become the accepted way forward.

Geothermal depends on the ability of the electricity market in any country to need baseload electricity at what is likely to be a relatively expensive price compared with fossil fuels or hydro unless there are limited alternatives, and to a time scale when the demand is inevitably uncertain. This is not market failure as such, but rather a need for geothermal to establish a niche position in specific markets so that there can be a long term commitment. It is important that the geothermal team works closely with the Governance, Markets and Planning team where appropriate in specific countries.

ESMAP total allocation is $4.675 million. During FY2016 the amount disbursed was $1,285,042. The implementation rate is about 50%.

Currently, ESMAP is supporting identification, preparation, and supervision of 10 geothermal investment operations (Djibouti, Ethiopia, Indonesia, Chile, Kenya, Fiji, Tanzania, Armenia, Turkey, and regionally in Latin America). In addition, more than 10 countries have benefited from technical assistance deployed by ESMAP. Knowledge dissemination and capacity building thanks to four GGDP Roundtables and to the partnership with the International Geothermal Association to develop global standards for the classification of geothermal resources and the organization of a course titled "Reducing Geothermal Drilling Risk". TAG welcomes the strong partnership in this program with key bilateral agencies, such as KFW, ICEIDA, and multi-lateral financing institutions and donors, such as the Climate Investment Funds.

ESMAP has moved towards support for specific geothermal projects from more general strengthening of the framework to enable investment. The projects are in Armenia, Djibouti, Ethiopia, Indonesia, Nicaragua, St Lucia and Tanzania. The Djibouti project has a grant allocation of
$1.1m and is recipient executed, but it is identified as at risk due to implementation delays; exploration drilling utilizing 8 financing partners including the World Bank is now scheduled to commence mid-2017. GGDP has a relatively low allocation of grants for FY17, but is currently using up unexpended grants from previous years. While there is undoubtedly a lengthy list of projects that will pursue Bank financing there will be a challenge in "picking" the right projects both in terms of their geology and the ability of their power markets to take the output at a price that can make the development bankable.

New activities under the program include, among others, the preparation of case studies, lessons learned from project implementation, geoscientific data management and quality in geothermal projects, and a gender and geothermal guidance note. TAG members are aware that DFID and USAID are also engaged in work in specific countries on geodata management and recommend that ESMAP establishes partnership arrangements in this activity.

TAG also recommends preparation of a standard document package for geothermal projects financed by the World Bank given the project implementation requirements by the Bank. This would include templates or standard documents for areas such as safeguards, procurement and supervision. It may include recommended Terms of Reference for consultant services, Bills of Quantity for works, specifications for goods and services, etc.

It is noted that Iceland has offered a collaboration with ESMAP whereby Iceland finances consultants for geothermal activities from a roster that it holds. Within this framework it is essential that ESMAP retains control so that there is no risk to the quality of its activities. TAG therefore recommends the creation of a roster of global experts for geothermal projects based on assessment of their qualification, and references from other projects, as well as area of applicable experience.

9.2 Renewable Energy Resource Mapping

Since October 2012 ESMAP has supported 19 countries in Africa and Asia in undertaking renewable energy resource assessment and mapping, focusing on biomass, small hydro, solar and wind. the total budget is $25 million. During FY 2016 about $15 million was disbursed. Many projects are now well advanced providing a solid basis for government strategies and the investment decisions of private developers. Demand for similar support, especially for solar resource assessment, grows as a result of technology cost reductions globally. Such mapping helps to invite investors to the countries with promising resource environments, as well as helping to reduce electricity tariffs due to the reduced cost for verification of resources for project development. ESMAP has adopted a new business model for solar and wind: preliminary mapping outputs for all developing countries will be made available free of charge.

ESMAP will continue funding in-country technical assistance to commission validated studies and follow-on work. In January 2017 a major milestone was reached with the launch of a new Global Solar Atlas. For the first time the latest solar resource data is available worldwide for the benefit of governments and commercial developers. It has a user friendly interface and operation. Due to efficient procurement it was possible to have coverage of 146 countries for only $140,000.

TAG recognizes the importance of RE resource mapping in the selected countries allowing the utilization of resources and facilitating private investment. TAG congratulates the ESMAP team on the successful outputs. TAG also welcomes cooperation with other organizations preparing global interactive maps available online, i.e. IRENA, NREL, KfW, etc. Though there is no doubt that the program needs to be continued, TAG recommends focusing available ESMAP resources on site specific operations related to the resource assessment, including measurements and monitoring at the specific sites, where World Bank operations are focused. This will increase the value of ESMAP support to reduce the risks for investments in clean energy significantly, because the investment grade feasibility studies and bankable business plans require more accurate and reliable information based on ground level measurements and monitoring, while general information on the resource at country level may be available from the above mentioned initiatives and/or satellite data.

9.3 Variable Renewable Energy Grid Integration Support Program

ESMAP's VRE Grid Integration Support Program aims to increase the capacity of countries to develop policies and improve investment planning as well as encourage the adoption of best practices for VRE integration. The program was launched in FY2015 in response to concerns related to the potential issues associated with the integration of increasing generation capacity into the grid. The program offers technical assistance for system operation and long-term grid planning, in the strengthening of electricity dispatch, generation and transport infrastructure as well as for the development of economic, legal and regulatory framework conditions tailored to VRE integration. The program's ongoing activities cover countries including, but not limited to, Sri Lanka, Costa Rica, India, Pacific

Islands, Guatemala, and the Seychelles. Since FY15, 22 countries have received assistance in the form of technical studies, grid code development, capacity building, and knowledge exchange.

In order to extend its activities, ESMAP has partnered with the Clean Energy Ministerial and NREL as part of the 21st Century Power Partnership and receives in-kind support from the Global Sustainable Electricity Partnership. In addition, the program has supported World Bank teams in a number of countries to obtain funding from the Korea Green Growth Trust Fund and, in the case of Small Island Development States, from the SIDS-DOCK Support Program. The program cooperates with the World Meteorological Organization. It also works closely with World Bank Clean Energy Global Solutions group.

As countries expand their use of intermittent renewables it is essential that their system operations are able to manage asynchronous load technically and have adequate reserves to manage supply and demand fluctuations. Generally, in lower income countries the system (transmission or distribution) and systems operations staff are not equipped to meet the new requirements and ESMAP's move into this area–often neglected by utilities themselves–is very welcome. TAG therefore congratulates the ESMAP team for an efficient kick-off and recommends analysis of country power system planning and development strategies in order to provide sustainable solutions and valuable support. The FY16 budget for the program is $1 million. The implementation rate is 84%.

The current portfolio of activities is generally biased towards middle income countries (notably India and Sri Lanka). As solar and wind projects become established in Africa there will be a significant demand for this ESMAP service, but demand may go beyond what is currently on offer. Technical integration is only one element of the matrix for effective system and market development. Dispatch rules and market operations are weak in many African countries, and variable renewables will also need to be integrated commercially through system optimization and analysis of the risk of stranded costs and curtailment. In some countries there will be a need to consider that there may be competition between renewables for parts of the market. It is recommended that ESMAP considers how this product could be developed to cover the wider technical and commercial issues, ideally in conjunction with work on Markets and Planning.

9.4 Solar Support Program

The Solar Support Program was designed to help catalyze investments in grid-connected solar technologies through targeted TA. Activities are focused on the enabling environment, feasibility studies and transaction advisory services, as well as global engagement for mobilization of climate financing, analysis and knowledge dissemination. The program also aims to support other ESMAP programs, such as VRE Grid Integration and RE Resource Mapping. The Solar Support Program will cooperate with the Climate Investment Funds (CIF), Public-Private Infrastructure Advisory Facility PPIAF and IFC.

TAG records successful commencement of the program with a solar roadmap for Vietnam to achieve its target of 12 GW of solar PV by 2030. Another activity is market assessment and pre-feasibility studies for the deployment of rooftop solar in Turkey. Under the program, a detailed technical feasibility has also been conducted for the hybridization of isolated mini-grids in Niger.

TAG recommends that the program covers not just the support of solar projects but also the commercial integration of large scale solar generation into nascent electricity markets.

9.5 CLEAN ENERGY

In overall terms the clean energy team has focused on the upstream issues that may prevent renewable energy getting to market: the shortage of information on resources, early stage project risks such as geothermal exploration, technical integration into existing grids. Generally ESMAP seeks to ensure that the clean energy will be economic in terms of lowest cost for the country concerned, although it is important that any cost assessments effectively incorporate additional costs arising from optimization, and potentially also the risk of stranded costs arising from PPAs that may not allow the wholesale power market to function. Because of its expertise in VRE grid integration, ESMAP is unusually well placed to develop capability in both system and market operations, and to bring greater commercial awareness into countries with blocked or politicized power markets. The regions that would most benefit from the application of wider expertise are primarily in Africa, but the lessons as to how to apply this expertise are more likely to come from Asia or Latin America where there has been investment in grid and in system operations, and where power markets have become at least partially effective.

10 ENERGY EFFICIENCY

In 2013, ESMAP launched the City Energy Efficiency Transformation Initiative (CEETI) to help cities identify, develop, and mobilize financing for transformational investment programs in urban energy efficiency. The CEETI covered 25 countries and 50 cities (20 more cities if EE diagnostics using TRACE are considered), including Ghana, Tanzania, South Africa, China, Indonesia, Philippines, Vietnam, Belarus, Kyrgyz Republic, Macedonia, Turkey, Ukraine, Uzbekistan, Brazil, Mexico, Nicaragua, Jamaica, Panama, Egypt, Iraq, Lebanon, Morocco, West Bank and Gaza, Bangladesh, India, and Sri Lanka. It supported WB operations of $900 million, and other leverage of USD 300 million. The approved budget for ESMAP activities was $4,945,000. Implementation rate is 72%, and disbursement rate is 58%.

ESMAP new activities in 16 countries are ongoing, with a total allocation of $1,449,050.

In the ESMAP Business Plan FY17-20 two complementary focus areas are formed based on the CEETI successfully implemented by ESMAP. These programs are i) Efficient and Sustainable Buildings and ii) Energy Efficient Cities Project Preparation Facility. Both programs provide TA, grants, knowledge activities and products to meet their objectives.

10.1 EFFICIENT AND SUSTAINABLE BUILDINGS

The objective of the program is to support the integration of EE with RE & other sustainability aspects in buildings, including how buildings are constructed, how they are retrofitted, how they use energy and where they are located. Currently the program is supporting the preparation of three new buildings-related operations that include sustainable energy components:

- India Energy Efficiency Scale-up Program (P162849) (FY18 pipeline) – $300 m
- Kyrgyz Republic: follow-up investment lending to the ongoing Urban Development Project (P151416) (FY16 active)
- Metropolitan Buenos Aires, Argentina: Efficient and Sustainable Urban Settlements: $200 m

The program has a target for FY20 of at least seven buildings-related policies/plans/strategies being informed. Currently work is underway in the program on informing five buildings-related policies/plans and strategies.

City-level

- Côte D'Ivoire: Urban development model for the Greater Abidjan to inform future urban plans of the city.
- Kazakhstan: Support to city governments of Astana and Almaty to inform EE financing mechanisms.

Country-level

- Panama: Support to the government on building code approval and implementation, green labeling standards implementation, and definition of a new set of indicators.
- Kyrgyz Republic: Support to the government to draft a roadmap for improving EE in the public sector.
- Western Balkans: Support to countries to establish EE funds (or other suitable financing schemes) for public buildings submitted to the government for approval, and to have preliminary plans to establish such mechanisms.
- Mongolia: Efficient Heating Project.

10.2 ENERGY EFFICIENT CITIES PROJECT PREPARATION FACILITY

The objective of the program is to Integrate EE in design, planning, management and implementation of projects that improve urban services**.** The program supported seven TA activities in FY16:

City-level:

- Odessa, Ukraine: Sustainable Urban Mobility.
- Liaoning, China: Energy Saving Management for water utilities.
- Kazakhstan: Support to city government of Astana and Almaty to inform EE financing mechanism.

Country-level:

- Brazil: Support in the creation of financial instruments for EE public lighting and industry.
- Panama: Support to the government on creation of an energy efficiency fund.
- Ukraine: Technical Assistance for the Ukraine District Heating Energy Efficiency Project.
- Mongolia: Efficient Heating Project.
- The program supports World Bank operations with EE components and increased mobilization of finance from development partners. Currently it supports preparation of the following projects: Vietnam Energy Efficiency for Industrial Enterprises GCF Proposal: $200 million World Bank loan, and additional $363 million in loans, equity, credits and grants by development partners, private financial institutions and industry.
- Brazil GCF Funding Proposal for Financial Instruments for Brazil Energy Efficient Cities: $180 million in GCF concessional loan, and seeking $635 million from other financiers, including MDBs, bilateral agencies, other local public banks and private sector investors.
- Kyrgyz Heat Supply Improvement Project (P157079), scheduled for FY18 quarter 1 delivery with total IDA allocation of $36 million.
- Metropolitan Buenos Aires, Argentina: Efficient and Sustainable Urban Settlements: $200 m.

TAG congratulates the ESMAP team for successful initiatives in the EE area, and targeting different approaches to different country contexts, e.g. scaling up EE investments in Mexico, building on synergies with IFC (EDGE example); crowding-in private sector investment (Brazil example), and leveraging IBRD/IDA/Climate resources (Vietnam example). It also welcomes the introduction of energy efficiency in the industrial sector into its activities, notably in Vietnam.

TAG recommends continuously sharing of knowledge and lessons learned and to increase the number of beneficiary countries. TAG encourages extension of cooperation with the sector activities within the World Bank, as well as with other development partners, to deliver a comprehensive approach to EE in cities.

It is noted that the activities to date are generally in middle income countries, and yet there is rapid urbanization now in low income countries. TAG recommends that ESMAP considers how the lessons learned from the programs to date can be integrated into the urban and industrial development strategies of these lower income countries so that energy efficiency is a factor taken into account earlier in the development process.

11 SIDS-DOCK SUPPORT PROGRAM

The SIDS-DOCK support program has supported 5 new activities in FY2016, out of a total of 13 across all three years of the business plan FY 2014-16, including 5 in Latin America and the Caribbean, four in East Asia and the Pacific, three in Africa and one global. Of the $9 million allocated in FY14-16 (total allocation FY12-16 is $13.7 million), $6 million had been disbursed by the end of FY16 (from the initiation of the program in FY12 to FY16), with another $6 million in the pipeline. A total of $1.968 million was disbursed in FY2016 itself as per table 14.2 (page 98) of the 2016 ESMAP Annual Report.. While the disbursement rate has been slow (31% in FY2016), TAG recognizes some of the challenges in terms of project preparation time and execution.

There have been several examples of ESMAP's engagement leading to follow on lending, including in St. Lucia on geothermal, with follow-on lending activity planned for drilling, as well as in Sao Tome, where ESMAP's engagement has led to follow-on lending for rehabilitation of a hydropower plant. It is likely that these lending activities would not have occurred absent ESMAP engagement.

At the same time ESMAP has been supporting a regional initiative in the Caribbean region and provided various knowledge projects, including peer-review and collaboration with the International Renewable Energy Agency (IRENA) on two separate reports (one on "Planning for the Renewable Future" and one on renewable energy case studies in island settings). The SIDS-DOCK support program has shown good capacity for cooperative engagement with donors, including with the UK's Department for International Development in the Caribbean (co-funding in St. Lucia), and with Australia and New Zealand in the Pacific Islands.

Despite some of the slow disbursement, SIDS-DOCK has overall performed well. Any new activities in FY 17 should be calibrated to ensure they can be completed in the funding cycle prior to the anticipated closing of the Program.

12 GENDER AND SOCIAL INCLUSION

Gender and Social Inclusion was transformed from being a standalone program during FY15 within ESMAP to being a cross-cutting thematic area which had been a TAG recommendation in the TAG 2015 report. Some 116 activities were tracked for gender aspects and included such areas as capacity building for energy efficiency leaders on gender, to gender elements of clean cooking and regional engagement. It is important to note that this included disaggregation of household surveys by gender, especially important in determining energy access priorities and results.

Initial results from the first six months under the new cross-cutting thematic are encouraging. Almost all of the regions reported that they had received considerable support from ESMAP with the development and implementation of gender aspects to programming, even in regions where clients may not typically request this type of support, and in areas such as geothermal and in safeguarding

work for hydro (provision of radios for communications among minority women) where such a gender dimension was likely not previously considered. Dissemination of lessons learned from these activities across different contexts will serve to further inform clients as well as Bank colleagues on the relevance of gender to energy, where some may not naturally focus on this work. TAG recommends that further opportunities to train gender experts in energy issues (and vice versa), including regional workshops should also be explored since there is still at times a lack of understanding of the relevance of gender to the energy sector, and vice versa. The inclusion of a chapter on Gender for the first time in the 2016 ESMAP annual report is a welcome addition. The ongoing tracking and monitoring of gender informed outcomes will be an important component of FY17-20 business plan, given that they were not specifically tracked in the FY14-16 business plan. TAG supports the inclusion of clear tracking measures to help guide ongoing work and measure success.

Where possible any opportunity for inclusion of gender indicators/aspects in the next iteration of RISE would be helpful, particularly reflecting opportunities and constraints in certain markets for women entrepreneurs (e.g. less availability of bank lending for scale up of businesses).

13 CROSS-SECTORAL LINKS: NEXUS

ESMAP is working across various sectors, most notably strategically in its recently launched co-management of the clean cooking and heating initiative, being co-led with the Global Health Practice. While provision of clean cooking solutions and fuels is an energy intervention, the relevance of health in shaping the types of intervention, and in assessing outcomes achieved, especially involving public sector financing, is widely recognized and increasingly supported by studies. These show that reduction in small particulates provided by some but not all interventions (WHO standards released in 2014) has a strong bearing on whether a cooking intervention has positive health benefits, and the extent of those benefits. The effects of air pollution, and specifically household air pollution, are recognized as an important contributor to early mortality as well as an array of non-communicable diseases. The engagement of the health global practice, together with ESMAP, it is hoped, will over time help clean cooking solutions verified as providing sustained health benefits to be taken up more broadly into the Bank's regular lending programs. TAG recognizes that this may take several years.

Both ESMAP and the health teams reported that the co-management is working well thus far. This is an example of cross-cutting engagement and collaboration that could become a role model for similar types of engagement across the Bank in other sectors such as water and agriculture. Indeed, in the cooking sector there is also opportunity for further engagement with the Bank's agriculture sector when considering interventions such as the use of biogas solutions, and within the Bank's energy and extractives practice around utilization of clean cooking fuels, and so on.

TAG notes that in FY16 the GTF included a new nexus chapter focused on the nexus of energy and water, food, health and gender, reflecting ESMAP interest in identifying driving engagement across multiple nexus areas.

14 COMMUNICATIONS, KNOWLEDGE, NETWORKING, EVENTS

TAG supports the planned move in ESMAP to more digital accessibility. The new online M&E dashboard which is currently in beta testing is welcome as a strong tool not only to facilitate donor tracking of outcomes, but also as a key public facing communications vehicle. At the same time Knowledge Exchange fora continue to serve as platforms for sharing of experience between different countries and projects, thus multiplying the benefits from ESMAP efforts.

The TAG recognizes the value of ESMAP's range of global as well as its targeted knowledge products including those aligned with Sustainable Energy for All, notably the Global Tracking Framework, the Multi-Tier Framework and the Regulatory Indicators for Sustainable Energy (RISE). The partnerships undertaken in the development of these knowledge products have served ESMAP well insofar as there was strong engagement with multiple stakeholders drawn from sector experts as well as civil society representation. They have become the primary reference points for tracking progress on SDG7 not only in terms of utilization by the UN for formal SDG7 tracking purposes, but also as key reference in the larger stakeholder community. It is recognized that the data does need to be as comprehensive as possible, and that data provision can be a challenge if governments are not fully cooperative.

TAG had recommended in its prior report to strengthen partner linkages, and notes in that regard new partnerships in FY16 including with the UN Regional Commissions and the work with new donors such as the Rockefeller Foundation on survey instruments. TAG supports the planned focus in the next business plan on retaining the current suite of global knowledge products for SDG7 given their value as a global communications and mobilization tool, recognizing the opportunity to deepen them further over time, and potentially strengthening gender indicators where feasible.

TAG does note the delay in the publication of the State of Energy Access Report (SEAR) which was planned for FY16, but whose launch has been delayed and is expected in spring 2017. This report is expected to be helpful as a complementary knowledge product, because it can provide more on case studies and "real life" examples than the GTF and MTF, to help inform and shape global policy and practice. Equally, TAG notes that two impact stories were completed in FY2016, and recommends more focus on such stories, particularly receiving content from the regions, to help provide more tangible examples of impact, as well as case studies in how that impact was achieved. In particular, TAG recommends that given the strong focus on African energy access, more impact stories showing how ESMAP's work is influencing outcomes particularly for un-electrified communities would be helpful.

TAG recommends as part of ESMAP's review and continued strengthening of its overall communications portfolio a strong focus on defining and articulating the ESMAP “brand” to ensure that it is being reflected across its suite of knowledge products and is as fully recognized for its role as think tank, influencer on World Bank Lending, “cutting edge” innovator and “honest broker” (ESMAP staff definitions of "brand").

15 MONITORING AND EVALUATION

The main objective of the ESMAP M&E system is to assess ESMAP’s effectiveness in supporting the WBG’s engagement with client countries. This includes measuring the impact and influence of ESMAP activities on World Bank lending operations, government policies, and country capacities, as well as the development community’s interventions in the energy sector. It aims to establish a linkage and identify ESMAP’s contribution (direct and indirect) in attaining high-level global strategic energy goals: Increase access to modern energy; Relative increase output from RE, ad rate of increase of EE improvement. ESMAP M&E is developed in close consultation with ESMAP donors, and aligned with World Bank’s Results Framework for Advisory Services and Analytics (ASA). ESMAP activities are measured against 5 key performance indicators: Influencing WB’s lending operations in the energy sector, influencing client/government policy or strategies in the energy sector, increasing client capacity, knowledge increased and innovative approaches and solutions generated.

The TAG learned that ESMAP has initiated improvement in its monitoring and evaluation system through integration into an online platform. The process of establishment of the new system is

progressing very fast. The process includes the following steps: identification of ESMAP Results Framework; development of M&E components, key documents and tools and launching a web based M&E system. The ESMAP team presented key features of the new system and shared the draft Risk Framework with TAG. TAG welcomes the initiative of the ESMAP team to simplify and improve documents and processes around grant requests and approvals.

TAG notes that "ESMAP is implementing a more robust reporting requirement within the Bank's Grant Monitoring & Reporting (GRM) systems, incorporating reporting on implementation progress, Outcome Indicators, Gender, private sector engagement, potential risks, etc. of ESMAP activities. It should be noted that indicators for outcome, gender, as well as potential risks and mitigation measures, are established for every approved ESMAP activity (i.e., as part of the proposal review), and the revised Grant Funding Request (GFR) and the GRM, as well as the updated M&E portal/dashboard, will systematically incorporate these features into standard ESMAP reporting." TAG welcomes this approach which should address the comments made by TAG in the section on risk management.

The M&E dashboard will also serve donors as a source of information about their efforts and contribution to the global development agenda.

16 STOCKTAKING OF ASTAE

The Asia Sustainable and Alternative Energy Program (ASTAE) supports countries in East Asia and Pacific (EAP) and South Asia Region (SAR) to transition to sustainable, inclusive, and low carbon green growth paths. Activities focus on renewable energy, energy efficiency and access to energy. At the same time program is assisting countries in climate change mitigation and adaptation. The current ASTAE business plan started in FY 2012 (original ASTAE Business Plan was FY12-15, then extended to FY12-17) and disbursements will be closed in June 2017, after two years' extension. Total budget of the program is $24,2 million that funded 68 grants. An amount of 24.2 million US dollars has been raised from three donor countries (Netherlands, Sweden and United Kingdom) exceeding the proposed budget of the business plan being $20 million. The amount disbursed during FY12-17 is $20 million. As of December 2016, 49 activities were completed. Currently 19 activities are ongoing.

During FY14-16 ASTAE's portfolio consisted of 37 activities (new, ongoing or completed in FY14-16) with allocation of about $16 million. Of these activities, 7 were new activities initiated during FY16, 16 were ongoing activities, and 14 were completed and closed in FY16. ASTAE supported a total of 68 activities under its current business plan FY12-16 with allocation of $28 million. By the end of FY16, 37 activities were completed and 23 were ongoing. Currently the 68% of total allocations are for EAP region (43 grants and $15.6m allocated). Demand from SAR was less: 25 grants and $7.3m allocated (32%). Half of the budget is concentrated in 4 countries: Indonesia (18%), Vietnam (12%), the Philippines (9%) and India (9%). The share of regional activities is 14%.

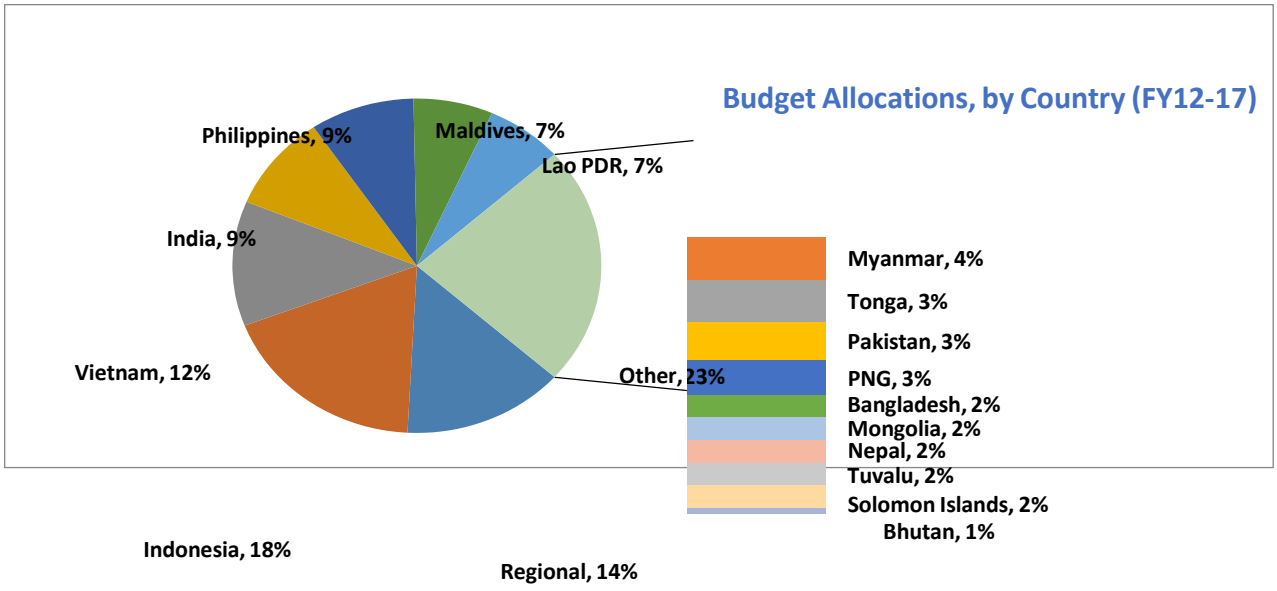
Half of the allocations for FY12-17 were focused on renewable energy pillar. Energy efficiency received 12% of allocations and 38% was for access, compared to 14 activities with more focus on energy access and 8 activities with more focus on energy efficiency.

During FY16, ASTAE had total disbursements of $5,575,386. Of this amount, about $5,476,333 (98%) corresponded to ASTAE financed activities disbursements and $0.1 million (2%) to program management and administration. Over the period FY12-17, an amount of $18.8 million has been spent, being 78% of the total budget for ASTAE. Although the progress of implementation is strong nevertheless it is clear that for the last year of ASTAE's current business plan, a strong focus needs to

be maintained on implementation. TAG recommends a close monitoring of progress so that funds can be reallocated quickly where necessary.

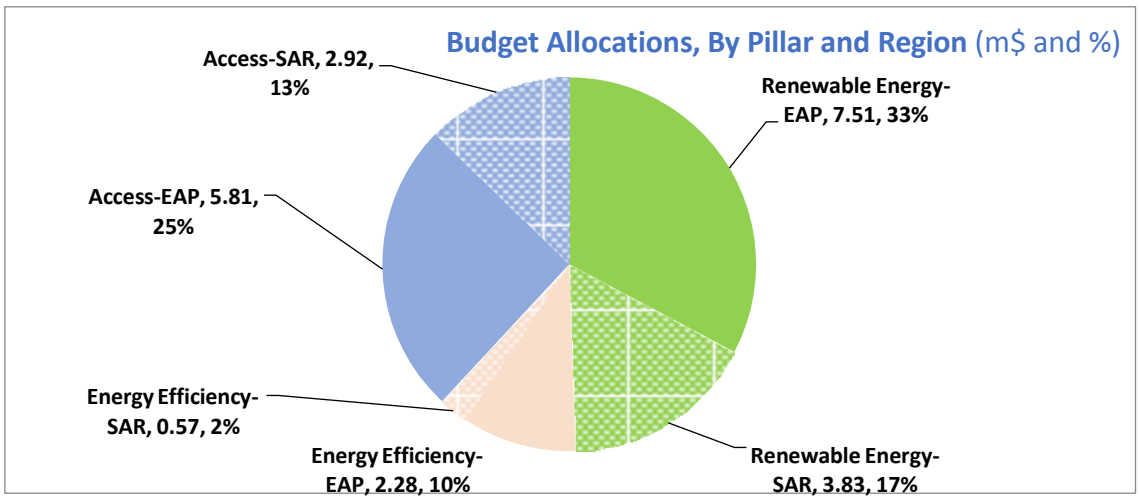
ASTAE measures its performance based on six indicators which include WB lending catalyzed, and others related to renewable electricity capacity and generation, energy access and CO_2 savings. The progress is more than satisfactory for all indicators except for households with access to modern energy services. TAG recommends continued tracking of activities similar to ASTAE using the same indicators so as not to lose the valuable information after closure of the ASTAE. During FY12-17 ASTAE provided 68 Grants to 21 countries. The EAP region received 43 grants and $15.6 million allocated (68% of total) and the SAR benefited from 25 grants and $7.3million allocated (32%). Half of the budget is concentrated in four countries due to the prioritization of high impact activities.

Figure 10 | ASTAE Budget Allocations FY12-17



Half of the allocations were directed to renewable energy, focused on Indonesia, Vietnam, India and the Philippines. The share of access to energy is 38%, mainly focused in India and Indonesia, regional activities and clean cooking in India, Lao PDR and Indonesia. Some 12% was allocated to energy efficiency, focusing on a range of cross-sector activities with a strong focus on Vietnam.

Figure 11 | ASTAE Budget Allocations by Pillar and Region



Taking into account the downstream nature of ASTAE activities, ASTAE operations are monitored using a results framework with five indicators. Three indicators are related to renewable energy, energy efficiency and access to modern energy, and two indicators are cross-cutting.

In total during FY12-17, with ASTAE support, $6.3 billion was approved by the World Bank Board.

16.1.1 Activities and Allocations FY14-16

During FY14-16 the ASTAE portfolio consisted of 37 activities with an allocation of US $16 million. Sixteen ongoing activities were initiated during the BP. Fourteen activities were completed, and seven new activities were initiated in FY16. The share of funding of IBRD countries is 34%, and 51% was allocated to IDA countries. The rest was allocated to the blended countries. During FY14-16 ASTAE allocated US $8.049 million to EAP and US $7.673 million to SAR. The share of allocations to FCV (Fragility, Conflict, Violence) countries was 9%. ASTAE also contributed to gender screening in the regions, with 35% of activities screened for gender.

16.1.2 Disbursements

The table provides the total disbursements of ASTAE in the period FY14-16 amounting to US $15.6 million, or 96% of the budget.

Table 7 | Table of ASTAE Disbursements (in US $)

Disbursement	**FY14**	**FY15**	**FY16**	**FY 14-16**
Project cost	5,030,180	4,858,660	5,471,330	15,360,170
Management cost	77,550	58,181	104,053	239,784
Total	5,107,730	4,916,840	5,575,390	15,599,600
Allocations	**6,220,000**	**8,698,000**	**1,342,000**	**16,260,000**

During FY16, ASTAE had total disbursements of US $5,575,386. Of this amount, about $0.1 million (1.8%) was allocated to program management and administration. As in previous years, renewable energy-focused activities had the highest disbursement amount among the ASTAE pillars (50%), followed by energy access (39%) and energy efficiency (11%). More funds were disbursed to EAP in FY2016 than SAR.

16.1.3 Results

ASTAE has defined performance indicators to measure its results. These indicators are: (i) total World Bank lending catalyzed; (ii) new capacity and increased generation of renewable electricity; (iii) electricity savings resulting from efficiency improvements; (iv) households with access to modern energy services; (v) avoided greenhouse gas emissions; and (vi) countries benefitting from ASTAE support.

The table in Figure 16 provides an overview of the results in FY16 and over the period FY12-16 against the values pledged by ASTAE in its BP. Progress is satisfactory for all indicators except for households with access to modern energy services. The ASTAE team informed TAG that the main reason for lack of progress in these access indicators was slow progress in preparation of the potential IDA/IBRF/GEF projects with ASTAE support, which would have contributed to these access indicators.

Table 8 | Results of ASTAE as Expressed by its Performance Indicators in FY2016 and over the Period FY2012-16

Indicator	Unit	Value pledged by ASTAE	Value achieved in FY 2012-14	Value achieved in FY2015	Value achieved in FY 2012-15	Value achieved in FY 2016	Value achieved in FY 2012-16	Progress (%)
1 Total WB Lending Catalyzed								
Project and program lending	million US$	3,200	4,218	1,013	5,232	1,050	6,282	196
2. New Capacity and Increased Generation of Renewable Electricity								
New capacity	MW	1,500	1,309	64	1,372	112	1,484	99
Increased generation	GWh/year	3,000	2,630	239	2,868	344	3,212	107
3. Electricity Savings Resulting from Efficiency Improvements								
Savings in capacity	MW-equivalent	1,000	351	0	351	25	376	38
Savings in generation	GWh/year	2,000	2,820	9	2,829	162	2991	150
4. Households with Access to Modern Energy Services								
Access to electricity (new)	Households	2,000,000	558,000	0	558,000	4,802,500	5,360,500	268
Access to electricity (improved)	Households	1,000,000	150,000	163,000	313,000		313,000	31
Improved stoves for heating	Households	5,000,000	1,195,000	0	1,195,000	800,000	1,995,000	40
5. Avoided Greenhouse Gas Emissions								
CO2 avoided over 20 years	million tons	200	375	4	379	32	411.2	206
Countries Benefitting from ASTAE Support								
Number of countries	Countries	15	12	21	21	21	21	140