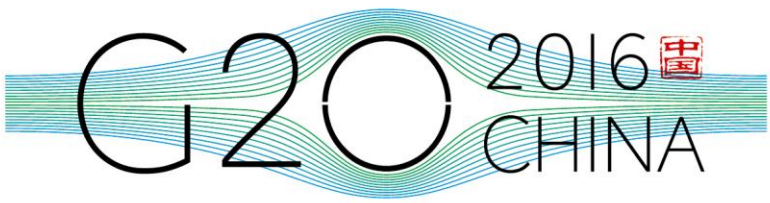

Enhancing Energy Access in Asia and the Pacific: Key Challenges and G20 Voluntary Collaboration Action Plan

(Final Version)

Enhancing Energy Access in Asia and the Pacific: Key Challenges and G20 Voluntary Collaboration Action Plan

A. Background

1. Energy access is defined both as the provision of adequate amounts of high-quality and reliable modern energy supplies, such as electricity, gas and liquid fuels (or equivalent complementary alternatives) as and when needed, and as the ability of individuals to purchase such supplies in the amounts deemed necessary for their daily use. It is instrumental in reducing poverty and ensuring sustainable development. Access to sustainable energy must therefore be available to all.[1]

2. Universal access to affordable, reliable, sustainable and modern energy services- is embraced in Sustainable Development Goal 7 of the 2030 Agenda for Sustainable Development. Energy access is intertwined with many other development issues including poverty, social inclusion, public health, food security and the environment. While progress has been made in recent years towards closing the gap, in 2012 about 1.1 billion people worldwide lacked access to electricity and 2.9 billion people lacked access to non-solid fuels for cooking[2]. The majority of the people without access to electricity and clean cooking are overwhelmingly concentrated in rural parts of Sub-Saharan Africa and Asia.

3. In 2014 the G20 Leaders' Summit endorsed the *G20 Principles on Energy Collaboration* agreeing to work together to ensure access to affordable and reliable energy for all. In 2015, G20 Energy Ministers adopted the*G20 Energy Access Action Plan: Voluntary Collaboration on Energy Access*, the first phase of which focused on enhancing electricity access in Sub-Saharan Africa. It is intended as the

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[1] *Sustainable Energy for All - Tracking Progress in Asia and the Pacific: A Summary Report,* ADB, UNDP, ESCAP, ENERGIA, Energy Access Practitioner Network

[2] Author calculation based on international Energy Agency (IEA) and the World Bank. 2015. "Sustainable Energy for All 2015—Progress Toward Sustainable Energy" (June 2015), World Bank, Washington, DC. Doi: 10.1596/978-1-4648-0690-2.

first part of a multi-phase plan that aims to "strengthen collaboration of G20 members on energy access in a flexible way, taking account of existing initiatives, and adding value through sharing of knowledge, experience and good practices, in accordance with national circumstances and developmental priorities".

4. This document represents the second phase of the plan that focuses on the Asia-Pacific region which will be implemented in tandem with the first phase of the Action Plan which focuses on Sub-Saharan Africa, building on the same momentum. There has been progress toward universal energy access, alongside substantially strengthened energy demand in the Asia Pacific region. At present, the Asia Pacific region with almost 60% of the global population, still has around 455 million people who lack access to electricity and 1.9 billion people still dependent upon traditional solid fuels for cooking and heating[3]. On current estimates more than 50 million people will still be without access to energy in 2040.[4] The Asia-Pacific region continues to face significant challenges in delivering universal access to affordable reliable, sustainable and modern energy services. This document prepared in consultation with Asia and the Pacific countries outlines major challenges and possible options that G20 members could embrace to address access deficits and accelerate trends towards universal access.

5. In the Asia Pacific region, energy poverty is the highest in the sub-regions of South Asia, Southeast Asia and in the Pacific Island Countries. Most people without energy access are located in areas that face the most difficult geographic challenges (e.g. rural, remote and islands). In absolute terms, the countries in the Asia-Pacific region with the largest electricity access deficit are India, Bangladesh, Pakistan, Indonesia and Myanmar. Countries with high proportion of the population without energy access tend to be located in the Oceania region including Papua New Guinea, Solomon Islands and Vanuatu. Additionally, the countries with the largest dependence on inefficient and unhealthy cooking methods are in the region, including in India, China, Bangladesh, Indonesia, Cambodia, Myanmar, Mongolia, Laos, Vietnam and Fiji. Even in areas where electricity access has improved, unhealthy cooking methods can persist. This situation requires significant effort across the region to encourage

3At present there are 2 versions of statistics adopted by the international community: 525 million from the IEA WEO modeling and SE4All – Tracking Progress in Asia and the Pacific: A Summary Report; 455 million from UN Global Tracking Framework.

4 IEA 2015, WEO Chapter 2: Global Energy Trends to 2040 (Developing Asia)

clean and efficient cook-stoves and fuels. Benefits include reducing energy poverty, deaths and illness from household air pollution, and enabling success in other areas of development.

6. Addressing energy poverty in the Asia-Pacific region will require, *inter alia,* enhanced international cooperation to promote innovative technological solutions, develop and scale up sustainable business models and increase financing and investment as a means to realize the goals set under the 2030 Agenda, in Sustainable Development Goal 7 on energy. However, the region is ready for energy transition towards sustainable and modern energy services. Many Asian and Pacific countries submitted Nationally Determined Contributions ahead of COP21 which signal strong intention to transform their existing energy sectors and in particular embrace renewable energy and energy efficiency. All developing countries, in particular least developed countries and small island developing States[5] are also a specific focus of the Addis Ababa Action Agenda, which encourages international cooperation to provide adequate support and facilitate access to infrastructure and technology for supplying modern and sustainable energy services. The outcomes of the Paris Agreement, and the implementation of the 2030 Agenda, is expected to further enhance deployment of climate financing for renewable energy and energy efficient technology and infrastructure in the region.

   Sub-regions within the Asia Pacific will have distinctly different needs for energy access, mostly due to geographical realities. The Pacific Island region and countries with large archipelagos, such as Indonesia and the Philippines, will need to go beyond traditional approaches to rural electrification and grid extension. Enabling policy for private sector investment, innovation, and regional integration will be important across the Asia Pacific region, but will have to adapt to sub-regional and country driven needs.

B. Progress on Implementation in Sub-Saharan Africa since the 2015 G20 Leaders' Summit

G20 Members and International Organizations have been engaged in supporting the implementation in sub-Saharan Africa (SSA) of the activities outlined in the G20 Energy Access Action Plan in many ways. Overarching initiatives such as the AfDB's New Deal on Energy for Africa, the Africa Renewable Energy Initiative (AREI), the Africa EU Energy Partnership (AEEP), and the UK's Energy Africa Campaign and Sustainable Energy for Girls and Women (SE4G&W) initiative are promoting access across the

[5] Based on AAAA Outcome paragraph 49 (http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf)

board. Numerous bilateral energy partnerships between G20 members and SSA states are in place. The AfDB, African Union Commission, and UNDP are supporting SE4All Action Agendas and Investment Prospectuses to promote coordination and to create investment opportunities. The Global Alliance for Clean Cook stoves is working to reduce the number of people without access to clean cooking solutions.

Various facilities are available to strengthen the enabling environment: Canada supports the Africa Legal Support Facility, the Kenya Extractives Enabling Environment and also the Enhanced Oversight of Extractive Industries in Francophone Africa, the UK provides the Public Private Infrastructure Advisory Facility (PPIAF), the Infrastructure and Cities for Economic Development (ICED) as well as the East Africa Geothermal Energy (EAGER) Technical Assistance facility. The SE4All Africa Hub with funding of the AfDB's Sustainable Energy Fund for Africa (SEFA) started the implementation of the Green Mini-Grid Market Development Program (MDP) in coordination with SE4All's Clean Energy Mini-Grid High Impact Opportunity.

Funds and programs to support project preparation and implementation have been made available, such as Germany's Project Development Programme (PEP), The Clean Technology Fund, the UK's CDC Group, Private Infrastructure Development Group (PIDG), Green Africa Power (GAP), Results Based Financing (RBF) for Low Carbon Access, and Uganda Get-FiT. For the period 2014-2020, the European Commission has earmarked EUR 1.5 billion of grant allocations to contribute to increasing renewable energy generation in Sub-Saharan Africa, and initiate "The Electrification Financing Initiative" to improve the sustainable business models there.

G20 members provide capacity building programs for various technologies. Brazil undertook technical missions on bioenergy to Swaziland and Ethiopia and offers a distant learning course on the bio energies. Japan supports geothermal capacity-building, feasibility studies and trial digging in countries such as Ethiopia. The Republic of Korea aids Cameroon to understand its potentials for renewables, to formulate its renewable energy strategies, and to implement the strategies with the long-term perspectives by supporting the Master Plan for the Development of Renewable Energy in Cameroon. Germany funds the Secretariat of the West African Power Pool in Cape Verde.

Many efforts on the regional level are underway. South Africa provides technical assistance to its neighboring countries and works through ESKOM in the Southern African Power Pool to improve the

regional energy infrastructure. The African Energy Leaders Group, supported by AfDB and UNDP, brings together public and private sector representatives to enhance regional cooperation. Australia supports the North-South Power Transition Corridor between Kenya, Tanzania, Malawi, Zimbabwe, and Mozambique. Regional planning and coordination are also assisted by a mapping of African energy initiatives undertaken by the Africa EU Energy Partnership (AEEP). Finally, various conferences and meetings have been organized and funded to bring together stakeholders in support of coordination. South Africa hosted the International Renewable Energy Conference (SAIREC) and the Africa Utility Week. Japan organized the Tokyo International Conference on African Development (TICAD) in collaboration with the UN, UNDP, AUC and the World Bank under the framework of multilateral cooperation.

In conclusion, G20 members and international organizations are very engaged in supporting implementation in sub-Saharan Africa of the activities outlined in the G20 Energy Access Action Plan. Yet, much more needs to done and the creation of access to energy needs to be drastically accelerated if the G20 wants to help to ensure the obtainment of SDG7.

C. The Difficulties and Challenges in Addressing Access in the Asia-Pacific Region

Strengthening Investment, Financing and Institutional Capacity

7. The Asia-Pacific region faces significant gaps in investment for energy access. Globally, around USD 50billion in annual investment is estimated to be required up to2030 to ensure universal access to clean, modern energy compared to current flows of around USD 13billion a year.[6]The majority of this investment required is to develop electricity generation, and transmission and distribution infrastructure.[3]SouthAsia, South East-Asia and the Pacific face the largest investment gaps[5], along with Sub Saharan Africa[3].

8. Domestic resources alone will not likely be sufficient to close the financing gap in the Asia-Pacific Region, and financing from international financial institutions and the private sector will play a crucial role with public sector financing playing a catalytic role. Many countries in the region have yet to put in

[6]International Energy Agency (IEA) World Energy Outlook 2015, OECD/IEA.

place enabling policies, legislation, regulations and incentives to attract such financing and also to minimize risks, mobilize micro-finance, and support technology demonstration.

9. The region requires support to build the capacity of policy makers to create the appropriate domestic policy, legal and regulatory environment. The technical and managerial capacity of energy practitioners working in energy utilities, the private sector and communities needs to be strengthened. Communities need training on sustainable operation and energy-use for value addition, including suitable management approaches. Knowledge needs to be transferred, and capacity built, in manufacturing, on procurement and improved business practices.

Disseminating Technological Options

10. More is needed to effectively disseminate information widely and encourage uptake of the use of innovative methods, technological options, proven business and distribution models and indigenous energy resources tailored to local context. It is important to develop energy systems with maximum resilience, given the vulnerability of many countries in Asia and the Pacific to natural disasters

11. Almost 52%[7] of the region's population is rural with low per capita energy demand. Extending the grid in these communities is not financially feasible in many cases making decentralized solutions using local resources preferable. For example, the IEA found that delivering universal electricity access in India would see the vast majority of Indians continue to receive their power via the grid, but that mini-grid and off-grid solutions would provide more than half of the electricity supply to those gaining access for the first time.[8] Business models such as Energy Service Companies (ESCO) or community management with effective operation and management systems are needed to ensure nationally appropriate reliable energy supplies.

12. The economies of the Pacific Island countries are heavily reliant on diesel fuels for power generation. Countries in the Pacific in particular Papua New Guinea (PNG), Vanuatu, and Solomon Islands,need support to enhance energy access through cleaner, hybrid solutions with appropriate technological options that suit the local conditions. Integrating mini and off-grid electricity access solutions into

[7] ESCAP Population Database

[8] International Energy Agency (IEA), India Energy Outlook: World Energy Outlook Special Report, OECD/IEA (2015).

national electrification plans can be a complementary strategy for cost effective on-grid solutions. G20 countries can share knowledge on establishing and enhancing appropriate national standards to provide quality assurance for the range of technologies providing such solutions

13. In the long term, a key challenge for the region is the transition to modern, clean and affordable renewable energy generation for ensuring energy access.

Integrating Energy Access and Other Development Needs

14. The region has a number of least developed countries (LDCs), landlocked developing countries (LLDCs) and Small Island Developing States (SIDS), as well as conflict affected countries, which have large number of poor people. It is therefore important to consider strategies that will build local capacity to manage and service energy access solutions.

    Technical training and strengthening vocational education that supports the deployment of energy technologies is a crucial strategy to ensure the success of energy access initiatives and reap broader development benefits. Community ownership and understanding of the energy technologies is crucial.

    Strengthening the capacity for systematic planning, including with energy authorities, is crucial to success. There are also many opportunities to integrate energy access development with broader development and livelihood promotion activities, for example the provision of energy efficient lighting or household energy solutions in the context of improved housing, or the integration of modern energy systems with water pumping for irrigation and sanitation. G20 members support for such efforts in SIDs, LLDCs and LDCs, directly relate to the goals under the 2030 Agenda for Sustainable Development and Addis Ababa Action Agenda on Financing for Development to support infrastructure investment for sustainable energy.

Enhancing Regional Cooperation and Collaboration

15. In the 2014 *G20 Principles on Energy Collaboration* leaders agreed to "Work together to make international energy agencies more representative and inclusive of emerging and developing countries."Furthermore, harnessing the knowledge of international and regional agencies and organizations in support of the challenges and needs of emerging and developing countries will be

crucial in eliminating energy poverty, securing energy supplies to meet demand and promoting free markets that foster economic growth.

16. Energy collaboration issues at the national level pose challenges in addressing energy access. The sustainability of energy systems could be enhanced through measures that promote synergy and coordination across relevant ministries on energy access, restructure utility companies, enhance sub-national collaboration on energy collaboration, and support establishing service centers near the load centers to support operation and maintenance. Standardizing equipment and service, and regulatory services for tariff and fee determination are also important.

17. Initiatives implemented at the national level need to avoid duplication. They should be combined with effective monitoring, evaluation and reporting mechanisms that allow updates on energy access and the quality of services provided.

D. Find a solution—Experience and Suggestions

Enhancing Energy Access Solutions, Experience from China and Other G20 Members

Remote and far-flung areas in the central western part of China lag the socio-economic development levels of the rest of the country. China still had about 40 million people without access to electricity by end of 1999. It was a significant challenge to the Chinese government in providing electricity to these people. The government has prioritized enhancing electricity access to those regions lacking electricity access as an important task of national electric power construction and livelihood improvement.

To improve the electricity access to these areas, China implemented the following:

i. Rural power grid renovation and upgrading Project

ii. Village-level electricity access project

iii. 3-year action plan to realize availability of electricity for no-electricity population

Major components undertaken under these were *power grid extension*, *micro-grid and independent power supply*. During 2013-2015, efforts to extend access to electricity were targeted at 2.73 million persons living in the inaccessible areas of Xinjiang, Tibet, Sichuan, Qinghai and other provinces covering 8000 administrative villages and 40 cities on electrification.

Two case studies on independent power supply and the extension of the power grid in China are presented in

Independent Appendix （II. Case Studies for the Creation of Energy Access in Asia-Pacific, China） along with case studies contributed by other G20 Members and International Organizations. Factors, including lessons learnt from the G20 case studies and important policies which have contributed to the successful implementation of these programs are explored below.

Success Factors: Realizing strong planning, guidance and policy supports

Strong planning, guidance and policy support is indispensable in efforts to achieve universal access. China prepared a phased approach to prioritize electricity access to populations without electricity in target areas. The planning looked into the area- that could be electrified with power renovation in rural areas, and implementation of independent power projects at the village level in targeted areas supported with appropriate policy formulation for this purpose. With plans in place, electric power construction in these areas was implemented in 2006 and National Energy Administration (NEA) formulated and implemented the *Three-year Action plan to thoroughly Realize Electricity Access for No-electricity Population (2013-2015)*.

The Brazilian "Light for All" program is another good example of the importance of public sector planning and involvement in promoting universal access. Economic barriers were overcome by long-term planning, the identification of target populations, and the allocation of significant funding by the Government. As the case of Singapore demonstrates, planning and coordination can be helpful not only on the local and national levels, but also between countries and at the regional level.

Success Factors: Ensuring investment support from Central treasury and enterprises

Enhancing energy access in rural areas requires high initial investment. The Central Treasury of China provided site specific investment support to cover part of the financing mix. For example, providing 80% of investment funds in Tibet, and 50% in Xinjiang and Tibetan region of Sichuan to reduce the investment pressures on power grid operators. Similarly, large-scaled power generation enterprises provided supports to decentralized systems as a part of their corporate-social-responsibility in enhancing electricity access.

The Australian case study on Vietnam is both demonstrative of the challenges of finding adequate finance and instructive on possible solutions. Interesting in this regard are the insights of the Korean case on accessing climate finance, demonstrating that this can bring additional investments into energy access projects. The instruments for blending finance presented in the Canadian contribution may incubate new financial models building on public, philanthropic, and private funds.

Success Factors: Engaging enterprises on providing public services to perform their social responsibility

Engaging enterprises and also local communities can contribute significantly to the success of access programs and projects. In providing services to no-electricity areas of China, the national and local power companies worked together on extension of transmission lines, construction of a sub-station and providing electricity meters. The State Grid Corporation and local power grid companies of Sichuan, Inner Mongolia and other places

provided electricity access to 1.545 million persons. Further, they were also providing supports to the power projects such as implementing village solar PV power projects.

The important role of corporations, large and small, is also highlighted by the German contribution on the Indo-German Energy Programme. Large companies offer scalable delivery channels and financial resources that can complement initiatives by smaller local and social entrepreneurs that provide solutions to meet local customer needs. The Korean case study on the Philippines shows the benefits of corporation between government funds, multilateral development banks, and local enterprises. Promoting innovative business models is key, which is evidenced most clearly by the inputs from the ASEAN Centre for Energy: importantly, the business model for an off-grid rural electrification project must have some degree of flexibility and fit the specific conditions of the community implementing the project. But as the World Bank case studies on Vanuatu and the UK case study on India demonstrate particularly well, it is also essential to engage the local communities in order to create awareness and ensure local applicability of the respective technological solutions. This is essential to reach a critical mass of consumers who can sustain a market for energy services and products.

Success Factors: Ensuring Sustainability of Energy Access Solutions

The success from China's experience is replicable for many other countries seeking to enhance energy access to populations without electricity by providing support for planning, policy formulation, implementation of appropriate measures and technology. It shows how the targeted support on key areas with engagement of private sector and government on financing and investment accelerates electricity access. The sustainability of the intervention requires local capacity building on operation and maintenance, quality of equipment and services, engagement of stakeholders and also use of such electricity services in enhanced livelihood with creation of several other opportunities.

In the Chinese case studies, sustainability issues on enhancing electricity access to the rural areas are addressed with:

- Implementing projects in collaboration of central government, local governments, power generation enterprises, power supply enterprises and operation and maintenance service providers with capacity development support provided to these institutions to overcome technical, financial and operational barriers.

- Selecting appropriate technology for power generation based on locally available resources that meets the demand and is also the most economic option with availability of operation and maintenance services. The Japanese case studies in particular highlight the need to invest in

technology development and innovation in order to diversify options and increase economic viability.

- Providing training to the operators of these energy systems and local grid operators. The local government and enterprises have worked together to compile user manuals, organized training and maintenance services in local languages. As the Australian case study on Kiribati shows local capacity can be a significant restraint that needs to overcome by investment in sustainable capacity. For Singapore, such investments where key in its efforts to guarantee a stable supply of energy. The case studies of the Global Alliance for Clean Cookstoves suggest that setting-up intermediary institutions can help with capacity-building, but also with a range of other issues.

- Engaging professional teams for the implementation to ensure quality and reliability of services in difficult geographical conditions. As the case studies contributed by the UK and the Pacific Community demonstrate, there is also a need to ensure quality standards for products, while avoiding the creation of unwarranted market barriers.

E. Energy Access Goals and Joint Actions in the Asia-Pacific Region

18. The global community committed to an ambitious global agenda '*Transforming our World: The 2030 Agenda for Sustainable Development* in September 2015 with 17 Sustainable Development Goals (SDG) including SDG 7 on energy. This embraces the goals to ensure universal access to affordable, reliable, sustainable and modern energy by 2030, closely aligned with SE4All's objectives.

19. In March 2016, the Inter-Agency and Expert Group (IAEG) on SDG indicators proposed an indicator framework for global follow up and review of the 2030 Agenda for Sustainable Developmentto the UN Statistical Commission. For energy access the following indicators are proposed: Percentage of population with access to electricity (indicator 7.1.1); and Percentage of population with primary reliance on clean fuels and technology at the household level (indicator 7.1.2).[9]

20. Many countries in the Asia-Pacific region have prepared road-maps and strategies including set quantitative targets for achieving energy access with associated plans and investment pipelines to

[9] Report on the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, Economic and Social Council, 19 February, 2016, E/CN.3/2016/2/Rev.1

achieve these targets. Indicators have been set at the national level such as India's target of 100% electrification in 2019, Indonesia's target to reach 100% electrification in 2020, China's goal of 40 million households adopting clean cook-stoves and fuels by 2020,implementation of the SIDS Accelerated Modality of Action (SAMOA) Pathways[10] on sustainable energy for Pacific Island countries – however the region will still fall short of achieving the SDG 7 target. The quality and affordability of energy services remains a challenge for many. Further support will be needed to strengthen the quality and reliability of services especially for productive use, and transition towards cleaner energy systems.

21. Short-term targeted support is needed to assist countries to develop clear policy framework, targets, and commitments. Longer support will be needed to assist countries in implementing programs, attracting investment and building energy infrastructure to make considerable progress towards the SDG7 indicators.

22. In defining energy access goals for the Asia-Pacific region under this voluntary action plan, long-term support should be in line with achieving global targets on SDG7 that could be met by 2030 and focused on initiatives for enhancing access to meet future demand growth triggered by enhanced economic activities and population growth. Most efforts on energy access for the rural population have applied intermittent technologies such as Solar Home Systems, and small-scale Micro Hydro plants. Further support is needed to transition these communities to higher tiers of energy services that can also serve for livelihood enhancement through energy availability for productive uses, as well as enable inclusive growth and public health gains.

23. Short-term support in the next 5 years is needed to address those populations without access to electricity and clean cooking fuels, such as technology transfer- where appropriate for renewable energy based or hybrid type energy systems, and innovations in developing new technologies and delivery models for better, clean energy access for thermal, cooking, and electricity usage. For clean cooking fuels efforts in the short term, the focus should be on enhancing the efficiency of existing cook-stoves and minimizing indoor air-pollution. In the longer term efforts should focus on the transition towards non-solid fuels.

[10] http://www.sids2014.org/samoapathway

Voluntary Joint Actions for the Asia-Pacific Region

24. The G20 Energy Minister Communiqué during the 2015Turkish presidency committed to collaborate to move SDG 7 goal forward to realize the development of a balanced, clean affordable, viable and reliable energy mix.

25. The first phase of the *G20 Energy Access Action Plan: Voluntary Collaboration on Energy Access* focuses on six thematic areas: Policy and Regulatory Environment, Technology Development, Dissemination and Deployment, Investment and Finance, Capacity Building, Regional Integration, and cooperation taking into consideration national needs and contexts. These thematic areas are equally applicable to the Asia-Pacific Region for energy access.

26. Considering national needs and demands in the Asia-Pacific region, the G20 may engage in dialogues on specific gaps in the national policy and regulatory environment, investment and finance, regional integration and coordination and collaboration, cleaner energy deployment and innovative business models including Public-Private Partnerships (PPP), while utilizing all indigenous resources.

27. Given the large population and diversity of geophysical conditions in the Asia-Pacific Region, the voluntary action plan will focus on strengthening collaboration of G20 members and participating countries from the Asia Pacific region on energy access issues in a flexible way, taking into account existing initiatives including on financing and focusing on value addition through sharing knowledge on experience and good practices, in accordance with national circumstances and developmental priorities.

28. Monitoring mechanisms for the implementation of theG20 Voluntary Energy Access Action Plan can rely on the global tracking framework put in place by UNSE4ALL. Relevant global, regional and national institutions should be engaged to support reporting arrangements, analysis and compilation of data.

29. G20 members are committed to work together on a voluntary basis with the Asia-Pacific countries on energy access including through possible joint actions below,- with full respect to the specific needs and special situations of each country and in harmonization with relevant regional organizations.

A. ***Enhance Capacity for Investment and Financing***

i. Encourage the private sector to contribute to technology and business innovation and capacity building for sustainable energy access in the region.

ii. Help Asia Pacific countries to develop business models and financial instruments that support investment and finance flows for long-term national plan's on energy access, including implementation of the SE4All Action Agendas and Investment Prospectuses, and strengthen the capacity of Asia-Pacific countries to develop project proposals for the Global Environment Facility (GEF), the Green Climate Fund (GCF) and other funds through use of readiness support programs and project development facilities.

iii. Enhance national and regional capacity to formulate policy and strategy on investment and financing of energy access projects in collaboration with multi-lateral banks such as The World Bank (WB), Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB), and the New Development Bank (NDB).Build on existing mechanisms for capacity enhancement such as ADB's support to establish a Centre of Excellence in Singapore and Indonesia, technical support to developSE4All country action agendas and investment prospectuses, and the organization of investor forums at the country and regional level that bring together project developers with potential financing institutions.

B. Provide Support to Adopt National Enabling Policies and Foster an Environment for Private Sector Investment

i. Bring in best practices from G20 members with experience in other developing countries on how to foster an enabling **national** policy environment that supports private sector investment on energy access.

ii. (i) Leverage on international and regional energy conventions, such as the G20 Energy Access Workshop jointly organized by UNESCAP and Singapore in October 2016 as a focal point for key stakeholders, to exchange and contextualize best practices, as well as a platform to foster business partnerships.

iii. Promote PPP models for energy access in feasible areas by supporting the formulation of enabling policy for such partnership.

C. Develop and Apply New Technology

i. Support the identification and implementation of technologies with sustainable business models for communities that are relevant to Asia-Pacific countries that lack access to energy services and are geographically difficulty to reach.

ii. Support the development and innovation of new technology required for grid integration of isolated systems, smart metering for efficient tariff collection, development of small-scale hydro, solar, wind, biomass based technology, hybrid technology for electrification; efficient and clean technology on biomass based cooking, manufacturing and standardization of efficient cook-stoves and pilot these in particular location for future replication.

iii. Assist on research and development activities to enhance the efficiency of locally available technology with appropriate technology transfer and support to develop equipment standards for quality assurance to expand energy access services.

D. Provide Targeted Support for Developing countries and Their Capacity Development

i. Provide targeted support on capacity development, financing and technology transfer, where appropriate to the countries with special needs such as the LDCs, LLDCs, and SIDs.

ii. Promote the sharing of knowledge on the policy, legal, institutional and regulatory environment to support energy access through south-south and triangular cooperation.

iii. Promote government support for energy access programs in poor areas with smart subsidy, community ownership, micro utilities, sustainable operation and innovative management models with focus on income generating activities and wider socio-economic development of communities.

E. Harmonize Approach with Global Commitments

i. Provide support for the implementation of national and sub-regional plans for energy access that support the implementation of SDG7 and SE4All Action Agendas and investment prospectuses as priorities.

ii. Work together with thematic agencies and international agencies such as SE4All's Asia-Pacific regional hub, international agencies - UNDP, UNESCAP, IEA, IRENA, ADB, WB, GACC, Energy Charter, and the Sub-regional organizations -ASEAN Centre for Energy (ACE), the SAARC Energy Center, and the Pacific Center for Renewable Energy and Energy Efficiency (PCREEE) in implementation of the second phase of the G20 Energy Access Action Plan .

iii. Provide support for community mobilization, raising awareness, information dissemination and implementation at the local level.

F. Possible Voluntary Cooperation Models

A. Voluntary Financial Support

i. Encourage voluntary financial support for energy access for Asia and the Pacific, includingfor complementary initiatives that will bring in positive multiplier impacts such as the productive use of energy, enterprise development, and integrated resource management.

ii. Strengthen and support existing mechanisms implemented through multilateral development banks such as the Scaling-up Renewable Energy in low income countries Program (SREP) supported by the Climate Investment Fund (CIF). ADB is also supporting energy access programs through various funding facilities such as Clean Energy Financing Partnership Facility (CEFPF), Energy for All- Project Development Facility (E4ALL-PDF), and Climate Change Fund (CCF). These mechanisms provide opportunities for collaboration on implementation of these joint actions[11] .

[11]CEFPF and CCF funds are designed to provide co-financing for ADB projects only through the various Operations Departments of the Bank.

iii. Support existing donor coordination services, for example the Pacific Regional Infrastructure Facility (PRIF) (details can be found in Independent Appendix), which respond to country needs and energy plans to provide technical, research and project design support matched to available infrastructure funding for energy access

B. Community Participation, Decentralized Energy Systems

i. Promote the sustainability of community-based decentralized energy systems and services, including community participation and ownership. Support the necessary establishment of enabling environments, for example, through **national** policies at the central government and at the sub-national level that ensures effective engagement of communities through the entire process including resources assessment, design and construction of the power system and its management.

C. Capacity Development

i. Engage in regional dialogues to share knowledge on challenges and opportunities, lessons learned and experience accumulated from formulating, implementing, monitoring and evaluating national policies and programs.

ii. Support regionally coordinated development by contributing to technical cooperation, capacity building, and market development programs that supports energy access and facilitate the transfer of technology and know-how, where appropriate.

iii. Support the establishment of an enabling **national** policy environment and facilitate institutional management through regional cooperation activities that facilitate energy access programs and policies, attract financial investment and deliver development assistance.

iv. Ensure the success of energy access initiatives and reap broader development benefits through technical training and strengthening vocational education that supports the deployment of energy technologies.

D. *Regional Connectivity*

i. Build up partnerships for regional connectivity that link supply centers with various and complementary energy resources and demand centers with varying peak load patterns and enhance energy access to communities among participating countries through such connectivity.

ii. Share best practice on existing cases of regional connectivity such as CASA 1000, ASEAN Power Grid and the proposed Asian Energy Highway to explore benefits for energy access through trans-boundary power trading.

E. *Coordinated Country Support*

i. In recognition of the country-owned SE4All Action Agendas and Investment Prospectuses as tools for the implementation of SDG7, align national policies and targets withSDG7 and create synergies in international support for developing countries on its implementation.

ii.

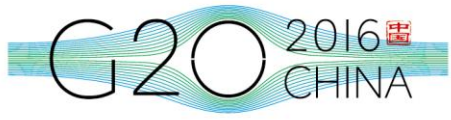
iii. Share data and information among countries and relevant institutions on energy access to facilitate effective monitoring, policy making and program design.

iv. Develop regional projects on enhancing energy access based on similar socio-economic conditions, resource availability, and on enhancing productive use, gender equality and livelihood.

F. *Innovative Business Models*

i. Collaborate on development of innovative business models that are bankable and scalable, to enhance financial visibility and attract investment considering energy usage pattern.

ii. Provide support to enhance the financial viability of energy access program with demand side management, residential sector energy efficiency program, and private sector engagement for service delivery.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