



**ASIAN INFRASTRUCTURE  
INVESTMENT BANK**

**AIIB Energy Strategy: Sustainable Energy  
for Asia  
Issues Note for discussion**

**October 2016**

## ASIAN INFRASTRUCTURE INVESTMENT BANK

### FIRST ROUND OF CONSULTATION ON ENERGY STRATEGY ISSUES NOTE

The Asian Infrastructure Investment Bank (AIIB) is a multilateral development bank that will focus on the development of infrastructure and interconnectivity in Asia. It will be based in Beijing and complement and cooperate with the existing multilateral development banks (MDBs).

The 57 countries that are the Prospective Founding Members of the AIIB are developing its core philosophy, principles, policies, value system and operating platform. The Bank's foundation is built on the lessons of experience of existing MDBs and the private sector, and it will put in place strong policies on governance, accountability, financial, procurement and environmental and social frameworks.

In this context, AIIB Vice Presidency - Policy and Strategy has developed an Issues Note to initiate the discussion about the Energy Strategy.

**Consultations.** The AIIB is holding two rounds of public consultations on the document. The objective of the consultation process is to shape and inform the development of an Energy Strategy for AIIB. This first round of consultation on the issues note aims to solicit inputs and comments for the preparation of the draft Energy Strategy.

**Written comments.** Written inputs and comments are welcome to be sent to the following email address: [es.consultation@aiib.org](mailto:es.consultation@aiib.org). These can be submitted until November 12, 2016. Written summary of the consultation will be posted on the AIIB website for public access.

The first round of consultation will inform the preparation of the draft Energy Strategy, which will be submitted for discussion by the Board in December and posted on website, followed by the second round of consultation in early 2017.

# Energy Strategy:

## Sustainable Energy for Asia

### *Issues Note*

#### Purpose of the Issues Note

1. The Asian Infrastructure Investment Bank (AIIB) plans to prepare an Energy Strategy, focusing on contributing to Sustainable Energy for Asia. This Issues Paper lays the foundation for a process of consultation on the Energy Strategy that will be developed by the AIIB. It outlines some proposed objectives, goals, guiding principles and implementation of the Strategy, and seeks comment on issues to be considered in the development of policy options that may be reflected in the Energy Strategy. The AIIB aims to finalize the Energy Strategy in the first half of 2017.
2. The paper and the opinions expressed and options proposed for discussion therein are the product of the staff of the AIIB with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of, and may not be attributed to, the AIIB, its management or its Board of Directors. The AIIB does not guarantee the accuracy of the data included in this work.

#### Introduction

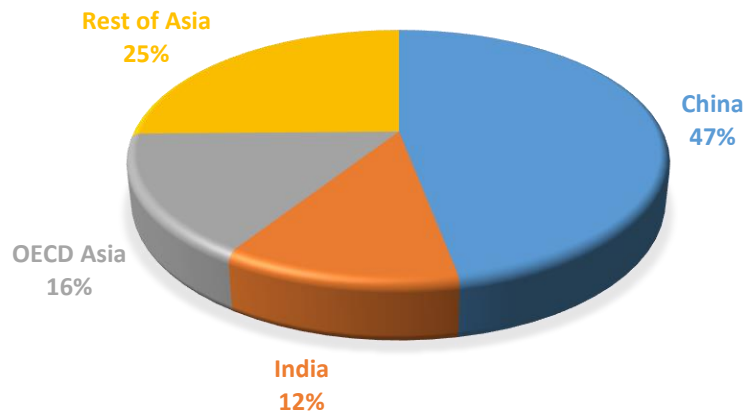
3. Energy is an intrinsic part of the world's economy and people's lives. As Peter Voser has said, energy is "the oxygen of the economy." "Without heat, light and power, you cannot build or run the factories and cities that provide goods, jobs and homes, nor enjoy the amenities that make life comfortable and enjoyable."<sup>1</sup> Regional economic and social development is contingent on the provision of affordable, reliable and sustainable energy for all. Many, if not most, of the developing countries in Asia<sup>2</sup> have experienced energy shortages and power disruptions that constrain industry and business activities. A large share of the population of these countries still lacks access to modern energy. In 2012, it was estimated that in Asia, more than 2 billion people did not have access to non-solid fuels (71 percent of the world population without access to non-solid fuels); and 464 million people lacked access to electricity (43 percent of the world's population without such access).
4. At the same time, primary energy consumption in Asia is growing. It increased from 3,528 million tons of oil equivalent (Mtoe) in 2000 to 6,432 Mtoe in 2013, accounting for 83 percent of the global increase in consumption during this period (see Table 1). At 4.7 percent per year, this was about twice the global growth rate during the same period. In 2013, Asia accounted for 48 percent of global primary energy consumption. Of this total, China accounted for 47 percent, followed by OECD Asia – 16 percent, India – 12 percent and remainder of Asia – 25 percent (see Figure 1).

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<sup>1</sup> Preface of Energy for Economic Growth: Vision Update 2012. The World Economic Forum.

<sup>2</sup> AIIB's definition of Asia includes "Asia and Oceania," according to the definition of the United Nation Statistics Division.

**Figure 1. Breakdown of Total Primary Energy Consumption in Asia (2013)**



Source: IEA Database<sup>3</sup>

By Region	2000	2013	CAAGR* (2000-13)
<b>Asia</b>	3,528	6,432	4.7%
<b>China</b>	1,175	3,024	7.5%
<b>India</b>	441	775	4.4%
<b>OECD Asia<sup>4</sup></b>	926	1,007	0.6%
<b>Rest of Asia</b>	986	1,626	3.9%
<b>World</b>	10,053	13,532	2.3%

\*Compound Annual Average Growth Rate; Note: number may not exactly add up due to rounding  
Source: IEA Database

5. More importantly, in 2013, Asia's reliance on fossil fuels was 5 percentage points higher than the world average, 86 percent compared to 81 percent. If primary energy consumption grows at the rate predicted by the International Energy Agency (IEA), it will reach more than 10,000 Mtoe using existing technologies, and somewhat less – 9,578 Mtoe – if government commitments prior to COP21 are implemented. If CO<sub>2</sub> emissions are to be reduced to achieve the goals of the COP21

climate change agreement (Paris Agreement, 2015), then consumption can only grow to about 8,000 Mtoe; to meet this challenging objective, the Intended Nationally Determined Contributions (INDCs) would need to be revised.

6. Achieving such energy growth while at the same time transitioning to a lower carbon future for the region will require significant improvements in energy transformation and use across the entire energy spectrum. Less energy-intensive, green growth is a daunting challenge facing all developing countries, including those in Asia, as urbanization progresses and people strive to improve their standard of living. It will require tapping the sizable potential for energy efficiency in existing infrastructure stock, embodying energy efficiency in new stock and developing renewable energy at affordable cost. Cumulative investment

<sup>3</sup> The breakdown is based on IEA's classification of countries and used only for statistical analyses to develop the Energy Strategy. It has no bearing on the regional classification of AIIB's operations.

<sup>4</sup> Non-OECD Asia is defined by IEA as: Bangladesh, Brunei Darussalam, Cambodia, China, Chinese Taipei, India, Indonesia, the Democratic People's Republic of Korea, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand, Vietnam, and other Asian (UNSD definition countries and territories). Furthermore, IEA notes that: "Individual data are not available and are estimated in aggregate for: Afghanistan, Bhutan, Cook Islands, Fiji, French Polynesia, Kiribati, Lao PDR, Macau (China), Maldives, New Caledonia, Palau, Papua Guinea, Samoa, Solomon, Timor-Leste and Tonga and Vanuatu.

needs for Asia during 2016-2025 to implement already announced policies are roughly estimated at US\$8,740 billion (constant 2012 dollars)<sup>5</sup>.

### Proposed objective of the Strategy

7. The proposed strategy could aim to accompany clients as they develop energy infrastructure to meet their energy needs and achieve their economic development and poverty reduction goals during the global transition towards an efficient and less intensive energy mix. It could define AIIB's policy principles and ensuing implementation guidelines for the energy portfolio.

8. **Energy sustainability** is defined in the strategy as access to adequate and reliable supplies of environmentally and socially acceptable forms of energy at competitive prices without compromising the energy needs of future generations. In this definition<sup>6</sup>:

- **Access** denotes the ability to purchase energy from domestic and foreign sources on a commercial basis, with no undue impediments imposed by governments, such as quotas on imports or exports.
- **Adequate** means that energy supplies are sufficient to meet consumers' needs and will remain so long enough to justify investments in processing, transport, distribution and final use of energy.
- **Reliable** signifies that the systems for delivering any particular energy form are inherently robust or can become so through technical, commercial, and administrative measures to provide reasonable security against unplanned interruptions.

9. The specific issues facing energy sectors in non-OECD Asian countries are similar to those facing most developing countries:

- The need for affordable, sustainable and reliable energy systems to maintain regional and global economic growth.
- Fast-growing primary energy consumption and dominance of fossil fuels.
- Declining energy intensity but at a lower pace than the 2.3 percent per year decline needed to achieve the global goals of sustainable energy for all by 2030 (SE4ALL energy intensity reduction target).
- Low access to modern energy; about 2 billion people without access to non-solid fuels and a little less than half a billion people without access to electricity.
- Fast growing per capita fuel combustion-related CO<sub>2</sub> emissions, which grew 3.8 percent per year during 2006-2013, much faster than the 0.9 percent global average.
- Extensive local pollution, with 19 of the 20 most polluted (PM<sub>2.5</sub>) cities in the world located in Asia.

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<sup>5</sup> Team estimate based on the results of IEA's World Energy Investment Outlook 2014.

<sup>6</sup> While the definition of energy sustainability has evolved over time, the proposed definition is in line with the definition adopted by most international organizations and academia.

## Proposed overarching Goals

10. The proposed strategy embraces the principles stated by AIIB founding members and the international initiatives to achieve global goals relating to sustainable energy and climate change, with special attention to two global sustainability goals:

- The UN General Assembly resolution 65/151 that launched Sustainable Energy for All (SE4ALL) initiative led by the United Nations Secretary-General to achieve universal access to modern energy services, double the share of renewable energy in the global energy mix, and double the global rate of improvement in energy efficiency by 2030; and
- The agreement of 196 nations during the UNFCCC Conference of the Parties (COP) 21 (30 November 2015 – 12 December 2015) to limit the world’s rise in average temperature to “well below 2 degrees Celsius above preindustrial levels and pursue efforts to limit the temperature increase to 1.5 degrees Celsius.”

The founding members’ declaration of AIIB as a *green Bank* is fully in line with these principles. Also, AIIB commits to minimizing the carbon footprint and local pollution impact of its own business activities and presence, including building and facility management, travel policies, use of electronic means of communication, etc.

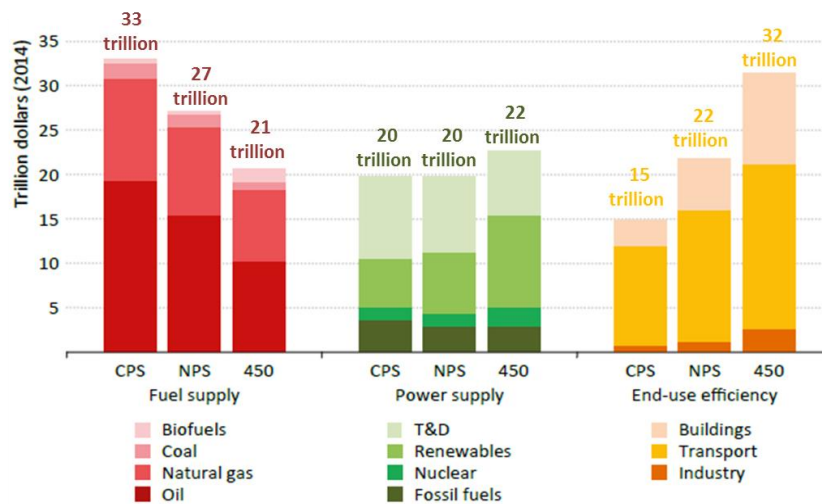
## Proposed Guiding Principles

11. The proposed guiding principles of the Energy Strategy respond to the aforementioned challenges and reflect AIIB’s mission and strategic direction. The first four reflect the proposed principles and the last two are cross cutting principles that will be pursued to the extent possible during the implementation of the strategy:

- ***Ensure energy security and equality.*** It is proposed that AIIB support regional energy infrastructure connectivity projects to improve reliable energy and power supply. AIIB would also place emphasis on reducing energy inequality; promoting, directly or indirectly, access to modern energy by those who currently have little or no access; and reducing the negative health impacts caused by indoor combustion of solid fuels.
- ***Realize Energy Efficiency (EE) potential.*** International experience and primary energy forecasts by international institutions indicate that energy efficiency is one of the major means to achieve global environmental objectives. Prosperity and wellbeing can no longer be gauged by the consumption of energy. Figure 2 below shows that limiting the world’s rise in average temperature to “well below 2 degrees Celsius above preindustrial levels” (450 Scenario) would require more than doubling global energy efficiency investments. High energy intensity in most non-OECD countries in Asia indicates that AIIB could contribute to tapping the existing large potential for energy efficiency. It is proposed that AIIB focus first on making the most of existing energy infrastructure stocks through rehabilitation and upgrade of existing generation plants with special attention to fossil fuel based ones and aggressive loss reduction programs in power and gas transmission and distribution networks. At the same time, it would develop the required financial instruments and engage potential financial intermediaries to tap the huge but dispersed EE potential in industry and buildings and transport. Cooperation and coordination with the transport practice is essential for the latter.
- ***Reduce the carbon intensity of energy supply.*** Figure 2 also shows that investments in fuel supply of the “450” scenario would be one third lower than the Current Policy Scenario (CPS),

mostly through continued low investments in coal, and a considerable reduction in oil investments. While investments in gas are somewhat lower, they remain important in all envisaged scenarios. Investments in the power sector overall would need to increase slightly, but with more focus on renewable energy, which needs to more than double to meet the goals of the Paris climate change agreement and sustained investment in power transmission and distribution. However, the needs of each client will be assessed based on its specific energy needs and conditions (such as energy resource endowment, affordability of capital-intensive investments, etc.), with the objective to support investments that would minimize global and local adverse environmental impacts of the portfolio.

**Figure 2: Cumulative world energy sector investment by sector and scenario, 2015-2040**



Note: CPS = Current Policies Scenario; NPS = New Policies Scenario; 450 = 450 Scenario; T&D = transmission and distribution.

Source: IEA WEO 2015

- **Limit local and regional pollution.** Fossil fuel production, transport and consumption have severe negative impacts on the local environment, especially in densely populated cities such as those found in Asia. Historically, issues related to local and regional pollution have been addressed mainly by limiting emissions of fossil-based power generation projects, especially coal. New projects are now being developed by Multilateral Development Banks (MDBs) to address energy pollution specifically and comprehensively, in order to counter the negative impacts on people’s health and wellbeing. It is proposed that AIIB consider a business line of multi-sectoral projects to contribute to clean up of Asia’s highly polluted cities and/or regions.
- **Catalyze private capital.** For varying reasons, to date, private capital investments in energy and infrastructure have been marginal in non-OECD countries, although partial credits, investment and country guarantees by MDBs have been instrumental in promoting successful projects in several countries. Innovative approaches have also been initiated using grants and concessional financing by some countries to reduce the cost of electricity generated under public-private partnerships (PPP) and/or to improve risk sharing in PPP ventures. The largest concentrated solar power (CSP) generation project in Morocco supported by the World Bank and African Development Bank and the geothermal project supported by the World Bank in Indonesia are representative of the former, whereas the envisaged support of a PPP geothermal project in Nicaragua by the World Bank is illustrative of the latter. It is proposed that AIIB explore innovative models to catalyze private investments, and significantly increase their contribution

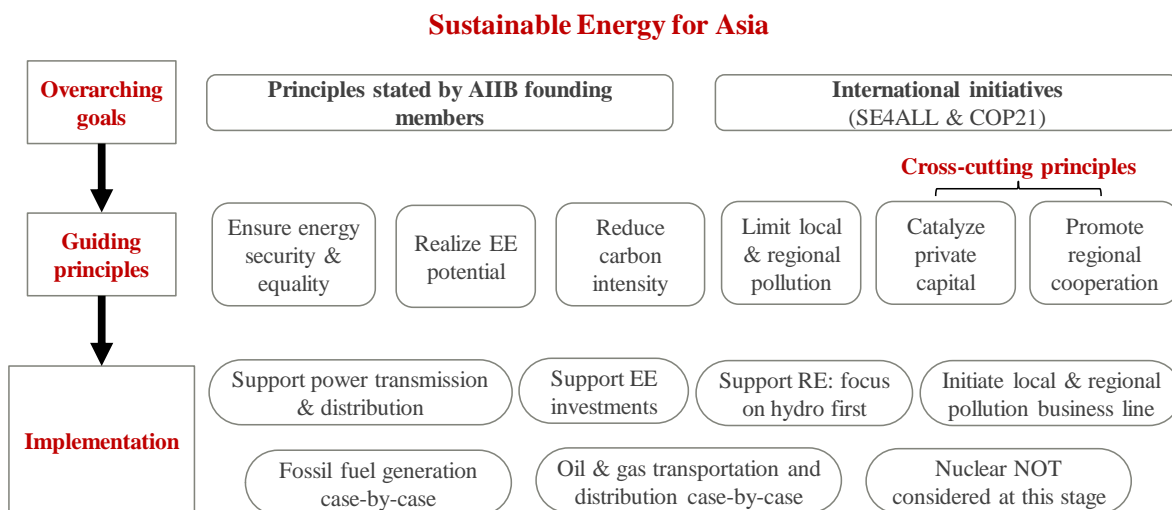


to meet the infrastructure needs of countries in Asia, especially those that are budget-constrained. AIIB would build upon successful experiences and lessons learned of MDBs operating in Asia, especially in PPPs. It might also explore with clients and private partners new cooperation models.

- **Promote regional cooperation.** It is widely recognized that regional integration is essential to take advantage of synergies among country programs, increase market size to improve competitiveness and create a critical mass for cooperative R&D and manufacturing capabilities. Efforts deployed by MDBs and bilateral organization in Asian countries and other regions have had moderate success. AIIB’s founding members stressed the need to increase regional connectivity of energy systems in Asia, especially power and gas, with a view to strengthening systems, improving the security and efficiency of energy supply, optimizing the use of resources, allowing for greater flexibility in their operation, reducing local, regional and global adverse environmental impacts, and fostering greater use of renewable energy resources.

10. Figure 3 depicts the schematic representation of the overarching goals, guiding principles and implementation guidelines.

**Figure 3. Diagram for Proposed Energy Strategy**



### Proposed Implementation

12. It is proposed that AIIB’s project selection process would be *technology neutral* but based on a number of key parameters/criteria, such as contribution of the project to improved energy security, economic growth, greater access of the poor to modern energy, reduction in carbon dioxide emissions and optimized utilization of overall energy sources, optimal connectivity of different generation sources to meet client needs, etc. Sectoral and cross-cutting issues related to potential investments are discussed below.

#### Sectoral Issues

- **Power transmission and distribution.** Power grid infrastructure development is an essential component of AIIB’s connectivity strategy. Support for the development of transmission and distribution infrastructure remains indispensable to ensure transfer of generated electricity to demand centers without the bottlenecks and high losses that are hampering economic growth in many Asian countries. Great efforts are deployed by the MDBs operating in the region but



substantial investments would still be needed to achieve the 2030 goals of access to modern energy. Support for power transmission and distribution could be one of the core areas for AIIB interventions, alone or in association with other multilateral or bilateral institutions.

- ***Energy Efficiency (EE) investments.*** Demand-side EE investments are in most cases economically justified but financially challenging because of pervasive subsidization of fossil fuels and electricity. They are also usually small and their implementation requires financial intermediation and capacity building, as indicated by the most successful public or private sector projects implemented by MDBs to date. Investments in energy efficiency (especially housing and small and medium enterprises) are generally small-scale and might require retailing channels and specific financial instruments (such as financial intermediary loans or budget support loans at national or subnational levels) and technical assistance to build client capacity. Most EE activities undertaken by MDBs have been supported by grants to build the capacity of financial intermediaries to evaluate EE projects proposed by interested parties and monitor achievements during implementation. At present, AIIB does not provide technical assistance either on its own or associated with lending. AIIB could consider supporting EE demand-side projects, despite the constraints cited above, by partnering with MDBs or bilateral agencies in the region.
  
- ***Renewable energy (RE) investments.*** RE investments are essential to limit CO<sub>2</sub> emissions. It is proposed that AIIB engage clients to develop intermittent RE [wind, solar photovoltaic (PV), run of the river hydropower] to reduce fossil fuel consumption and increase access to modern energy through decentralized generation. Moreover, data collected to date indicate that: (a) out of the 20 countries with the largest wind potential, only 4 are in Asia; (b) out of the 20 countries with the largest solar potential, 8 are in Asia; and (c) about two-thirds of the hydropower potential in Asia is untapped. Currently, AIIB does not manage trust funds. Therefore, to maximize the penetration of RE in the energy mix, it is proposed that AIIB consider:
  - (a) supporting economically and financially viable hydropower, in a manner consistent with the provisions of the Environmental and Social Framework (ESF) of AIIB and lessons learned by MDBs operating in Asia and other regions. Although financing for hydropower lessened during the late 1990s and early 2000s, MDBs are now reengaging clients, as development of hydropower in an environmentally and socially sound manner could contribute to achieving global environmental goals. AIIB could consider significant rehabilitation of existing hydropower infrastructure to improve efficiency and maximize use, and selective support for new economically, environmentally and socially justified hydropower projects on a country or regional basis, incorporating lessons learned;
  
  - (b) building partnerships with other MDBs/bilateral agencies operating in Asia to access concessional funds and grants from global funds, both existing or under consideration, that are required to improve the financial viability of most investments in renewable technologies, in particular intermittent ones; and,
  
  - (c) engaging high-income countries with sizable intermittent RE resources and the capacity to subsidize them, particularly solar with adequate storage, to develop innovative and transformative projects. High-income countries with sizable solar potential have not sought financing from MDBs to develop their power infrastructure, with the possible exception of support of some projects by the Islamic Development Bank (IsDB) in the Gulf region. It is proposed that AIIB explore the development of transformative but still high-cost

technologies, such as concentrated solar power (CSP) in Gulf countries, to contain consumption of fossil fuels and bring down the cost of the technology.

- **Local and regional pollution investments.** Stand-alone local and regional pollution projects are a new business line that MDBs operating in Asia have recently initiated or are considering to address the debilitating impacts of local and regional pollution on Asian economies and populations. Economic valuations of local environment externality costs are country- and even region-specific; they require detailed studies of negative impacts of pollution on the economy and health of the population, as well as a broad range of economic assumptions, including sensitive assumptions such as the valuation of lost lives. The results of high quality studies carried out in developed and some developing countries can under carefully determined assumptions be transferred to Asian countries where fewer studies have been carried out. AIIB could consider supporting from the outset projects that limit negative impacts of local and regional pollution at a variety of scales.
- **Fossil fuel power generation investments.** It is proposed that such investments be considered by AIIB if they contribute to reliably and securely meeting the countries' energy needs and access goals of SE4ALL. They will be contingent on the use of commercially available clean technologies to reduce local and global environmental impacts. Gas, when available at affordable price, would be considered during the transition to lower carbon intensity power generation mix. Coal- and oil-fired power plants would exceptionally be considered if cleaner technologies are not available for well-founded energy security or affordability reasons.
- **Oil and natural gas processing, transportation and distribution.** Private sector involvement is more likely here than in other subsectors, as international oil and gas companies have the technology and financial strength to support such projects in many cases. In some countries in Asia, national oil and gas companies also are active in these subsectors and governments may express interest in AIIB intervention. AIIB support could be based on the contribution of such projects to reliably and securely meet the country energy needs. Development, rehabilitation and upgrading of natural gas transportation (including storage) and distribution networks would also be pursued in order to foster greater penetration of gas during the transition to a “decarbonized” power sector, especially in Asia where such penetration is low compared to other regions.
- **Nuclear power generation.** It is proposed that the financing of nuclear plants will not be considered by AIIB at this stage. This could be revisited if justified and internationally recognized needs emerge in client countries. In order to engage in nuclear power, AIIB would have to develop the capacity to be involved in such complex and capital-intensive projects.
- **Adaptation projects.** “It was estimated that between 10 and 15 percent of the (future) required infrastructure investment could be attributed to making such investment sustainable, by ensuring lower emissions, higher efficiency and resilience to climate change.”<sup>7</sup> Climate change adaptation is therefore emerging as a business line pursued by grant facilities, such as the Global Environment Facility and MDBs. It is proposed that AIIB explore partnering with others or developing on its own a climate change adaptation business line.

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<sup>7</sup> A. Bhattacharya, M. Romani and R. Stern: Infrastructure for Development: Meeting the Challenge (London School of Economics - 2012)

### *Cross-Cutting Issues*

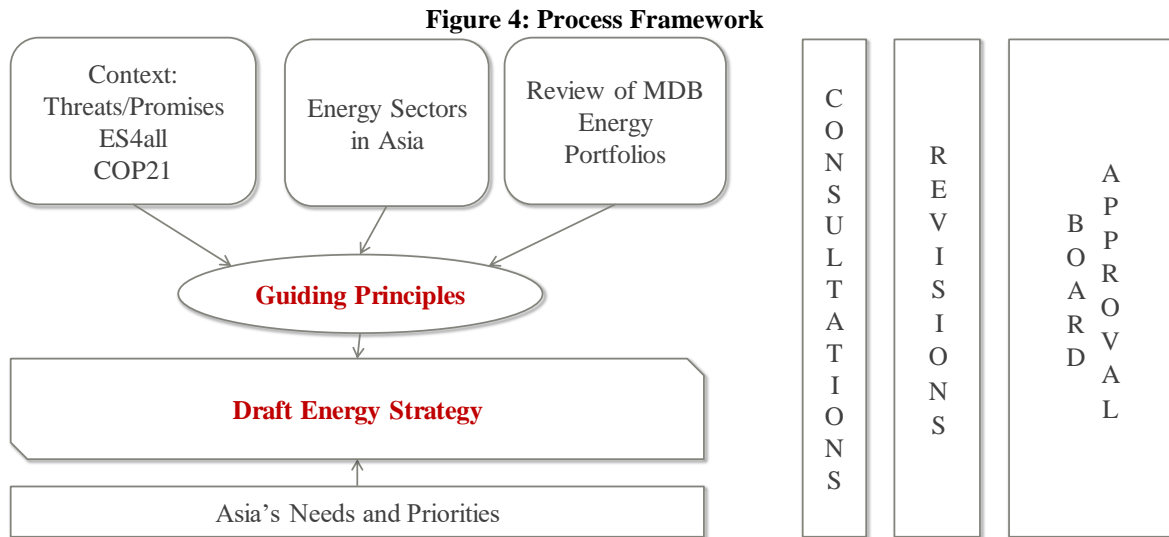
13. While global environmental and sustainable energy for all goals and principles are widely accepted and embraced by other MDBs and clients, their application is not always straightforward, as “green” energy investments require: (a) new approaches to evaluate their economic viability as they may not be economically justified considering the assumptions traditionally used by most MDB; (b) highly skilled and diversified teams; (c) a solid knowledge base; and (d) effective coordination between sectoral departments to meet client needs efficiently. These four cross-cutting issues are discussed below:

- Development of RE investments and climate change projects raises issues relating to the assumptions used for discount rates, carbon price and externality costs of local pollution used in economic evaluations of projects, such as: (a) high discount rates indicate a strong preference for the present; (b) low carbon prices underestimate the economic impacts of climate change; and (c) low local and regional pollution externality costs lead to pollution levels beyond the absorption capacity of the environment, as experienced in most Asian cities. Many countries and all MDBs have revised or are revising assumptions to be used in climate change projects. AIIB could reflect the progress and results achieved in this field in its economic evaluation guidelines. In the meantime, it will consider temporarily adopting the new operational rules issued or under consideration by MDBs operating in Asia or by advanced environmental agencies, such as the United States Environmental Protection Agency. It could rely on results from country- or region-based studies that evaluate negative impacts of local and regional pollution and transfer them to the Asian context, based on well-established and accepted methodologies. AIIB could also build or acquire, as soon as possible, the required expertise in this regard.
- Developing a strong and diversified energy portfolio is contingent on progressively building a highly skilled and diversified team (staff and consultants) with recognized expertise in technical, economic and financial aspects of project conception, evaluation and supervision. For example, strong hydropower technical expertise and highly qualified environmental and social specialists are prerequisites to engagement with clients in developing large hydropower schemes. Neglecting any of these aspects can lead to a weaker portfolio. As AIIB is committed to remaining lean, it is proposed that the number and diversity of staff will be carefully evaluated during the preparation of the business plan following adoption of the Energy Strategy, to ensure adequate skills and capacity to efficiently implement green projects and achieve the overarching goals.
- AIIB has currently no capacity to engage in knowledge based and policy dialogue activities. If desired, its development as a modern knowledge based institution and advisory services provider would take time. In the early stages of building its energy portfolio, AIIB could build partnerships with other MDBs to ensure that its energy team has timely access to existing knowledge bases. This issue could be revisited if and when AIIB decides to develop its own EE pipeline and knowledge based activities.
- Incentives for real interconnectivity of infrastructure is essential to avoid fragmentation and lack of coordination among concerned sectors (often referred to as “silo syndrome”). This has frequently occurred in management of complex infrastructure projects. During the development of its budgets, AIIB could avoid disincentives for sectoral departments to work together to meet client needs in the most efficient way. Collaboration and coordination are needed among the different sectors, such as EE and sustainable urban development with the transport sector; multi-purpose dams with the agriculture sector; access to modern energy with the human development and agriculture sectors; etc.

## Proposed Process and Timeline

14. Figure 4 depicts the proposed process to develop the Energy Strategy.

15. The data collection to set the international and regional context in which AIIB will operate has almost been completed but it will continue to be refined and complemented as the preparation of the Strategy progresses. Review of the energy sector in Asia is essential to validate the issues that need to be addressed and the guiding principles of the Strategy. The task is progressing well and will soon be completed. The review of the energy portfolios of MDBs operating in Asia to inform AIIB's strategic choices is underway. The drafting of the strategy will commence after the Board meeting and the draft will be revised as the consultation progresses.



16. The proposed timeline is as follows:

- October-November 2016: first round of consultation on the Energy Strategy Issues Note. Written summary of the consultation will be prepared.
- Early 2017: second round of consultation on the draft Energy Strategy. Written summary of the consultation will be prepared.
- June 2017: Finalization of the Strategy and submission to Board for approval.