as part of long term climate strategies. ADB will encourage plans that are strategic, goal-based, and time-bound and underpinned by a systematic analysis of technological options, costs, and social and environmental impacts. Such plans should include three key quantitative and timebound targets: (i) decreasing CO2 emission intensities; ii) peaking of CO2 emissions; and iii) achieving carbon neutrality. ADB will seek to identify and finance priority investments arising from these long term plans.

86. ADB will not finance any coal mining, oil and natural gas field exploration, drilling or extraction activities. ADB will not finance any new coal-fired capacity for power and heat generation or any facilities associated with new coal generation. ADB will support DMCs to mitigate the health and environmental impact of existing coal-fired power plants and district heating systems through financing of emission control technologies. However, ADB will not participate in investments to modernize, upgrade, or renovate coal facilities that will extend the life of existing coal-fired power and heating capacity unless it is to re-engineer such plants for use of cleaner fuels, such as natural gas or renewable energy sources. For re-engineering to natural gas, the project must demonstrate how it will contribute to a country achieving net neutrality by mid-century, such as through retirement or adoption of carbon capture, utilization and storage by that time. ADB will support DMCs in planning for early retirement of coal power plants and will support decommissioning of coal power plants and site redevelopment for new economic activity, including cleaning of hazardous materials, restoring soil and water, redevelopment of the buildings, and upgrading existing infrastructure. In providing support for coal phase out, ADB will support new job creation in cooperation with the local communities and stakeholders. The development of an approach for just transition will support ADB in this development.

87. ADB may finance natural gas projects (including gas transmission and distribution pipelines, LNG terminals, storage facilities, gas-fired power plants, natural gas for heating and cooking) when the following conditions are all met: (i) provides energy services to those who currently are without said energy service or will provide a more modern means of providing the same energy service (e.g., natural gas stoves to replace traditional biomass stoves or natural gas power to provide last-mile electricity); ii) demonstrates that no other technology can provide the same energy service at an equivalent economic cost that considers the social cost of carbon (i.e., natural gas power would be compared to renewables plus storage to provide the same level of service); iii) uses high-efficiency and internationally best available technologies for new plants, retrofit or fuel switching, replacement, energy efficiency improvement, or heating projects; (iv) for natural gas power generation, will result in a net reduction in grid emission factor (e.g., natural gas or replacing diesel or coal power); and v) demonstrates alignment with targets to achieve carbon neutrality by mid-century, avoiding long-term lock-in into carbon infrastructure and significant risk of creating stranded assets. ADB will define sound screening criteria for other fossil fuel-generation projects, notably natural gas. A detailed guidance note will be issued to staff.

88. ADB may participate in financing projects with hybrid electricity solutions involving fossil fuels as backup systems together with renewable energy for isolated grids, remote areas, and in fragile and conflict-affected situations when the following conditions are all met: (i) configurations without fossil-fuel backup are not technically viable; (ii) standalone renewable energy and storage systems without fossil-fuel backup is not economically viable; and (iii) there is a clear plan to reduce the system's dependence on fossil fuel by enhancing renewable energy and/or renewable energy storage solutions over time.

89. ADB will continue providing capacity development, technical assistance, and advice

on enabling regulatory measures in support of DMC programs to identify and remove hurdles to the development, demonstration, and commercialization of carbon capture, utilization, and storage technologies. Realizing the crucial role of these technologies in the long-term, particularly for the difficult-to-decarbonize industry sectors, ADB will support carbon capture, utilization and storage investments for power plants and industries. ADB will not finance carbon capture, utilization and storage in the context of enhanced oil recovery.

90. Liquid and gaseous fuels and energy carriers represent another important avenue for providing a stable supply and storing energy from various renewable energy sources, including sustainably sourced biomass, waste, and variable renewable electricity. In the future, sustainable biofuels, and synthetic fuels based on carbon capture or hydrogen, may also provide alternatives that can replace the use of fossil fuels in various industries. ADB will support such advanced biofuels in DMCs to reduce their dependence on oil and their transport sector emissions.

91. ADB will not finance investments in nuclear energy. Despite its ability to provide low-carbon baseload electricity, nuclear power development faces many barriers, such as public acceptance, risks related to nuclear proliferation, waste management, safety issues, high investment costs and long time needed for preparation and construction. As a result of these barriers, there is not strong demand among DMCs for ADB to support this technology.

Increasing the Resilience and Efficiency of Electricity Infrastructure

92. Electricity infrastructure is a lifeline system. It is essential for the most critical services that societies provide, as well as for the daily functioning of people's lives, economic activities, and public services. Managing climate change and disaster risks calls for careful attention to resilience and requires strong awareness and quantification of risk in power system planning, including risks stemming from climate change, disasters triggered by natural hazards, malicious attacks, and human errors, and assessment of the net benefits of investments in resilience to help inform power system planning.

93. ADB has decades of financing experience in developing robust power transmission and distribution (T&D) infrastructure. ADB's assistance in transmission and distribution helps DMCs improve the reliability of the electricity supply, connect additional supply capacity to the grid, reduce technical losses, power theft and reach outlying and previously unserved regions. ADB will support deployment of digital technologies including smart meters to reduce technical and commercial losses and encourage demand side energy efficiency, peer to peer trading using blockchain technology for energy markets, AI for predictive grid management and resilience leveraging on the availability of 5G telecommunication networks.

94. For many DMCs building resilience means a serious consideration of the trade-off, due to funding constraints, between building greater climate and disaster resilience versus expanding the network to reach additional households. Many advanced economies of the region have developed, for example, high levels of grid redundancy or shifted from overhead lines to underground cabling at high cost to enhance their disaster resilience. Such measures may not be within the reach of DMCs where there is an imperative to invest in extending services to those lacking it or strengthening the grid to tackle serious service deficits. However, not investing in resilience measures can lead to higher costs due to infrastructure failure and the rebuilding requirements after extreme events.

95. ADB will support DMCs in building higher resilience for the transmission and

distribution subsector, which is at the forefront of combating the effects of disasters triggered by climate change. Electricity supply is a uniquely critical enabler across all other infrastructure sectors. This makes it also a uniquely vulnerable target of cyber-attacks as well as disasters triggered by natural hazards. The ever-increasing dependence on electricity, such as in cities, combined with the increased climate and disaster risk, translate to a heightened need for system-wide resilience, i.e. the grid's ability to withstand disruptive events, limit their impacts, adapt to their consequences, speedily recover, and re-establish the electricity service. This will require undertaking climate and disaster risk-informed system-wide planning of the energy sector, integrating structural and non-structural resilience features in energy infrastructure design, construction and operations and maintenance, and strengthening disaster preparedness for energy sector.

96. In working with the DMCs, ADB will also pay attention to the long-term impacts of climate change. Such impacts include hydrological changes, accelerated growth of biomass with consequences for renewable energy production, and the increasing number of hot summertime days causing stress to the electricity system by high system peak and cooling energy demands. ADB will support DMCs in integrating assessments of such impacts and consequent investment considerations in their long-term energy supply strategies and National Adaptation Plans.

97. ADB will encourage the utilities and transmission and distribution companies to incorporate recent advancements in grid technology and to consider emerging demands, such as greater variability in load flows due to variable renewable electricity, in their planning of transmission and distribution subsector projects. ADB supported projects may therefore consider advanced conductors, dynamic line ratings, advanced grid control systems including anti-blackout technology, various demand response mechanisms, on-grid electricity storage, distributed generation, cyber security and digital smart grid solutions, which are among the available options to increase grid reliability, flexibility, and resilience. ADB will support energy utilities to address their environmental liability as transformers in some DMCs may still contain Polychlorinated Biphenyls (PCBs) that need to be removed from service or dechlorinated by 2025 and disposed of by 2028 under the Stockholm Convention. In addition, ADB will support DMCs to set up emission control standards and encourage use of alternatives to use of sulfur hexafluoride (SF6)—the most potent greenhouse gas—in gas insulated switchgear substations.

Ensuring a Just Transition

98. The transition to a carbon-neutral economy will affect every aspect of how we produce goods and provide services, particularly in conventional energy industries, and will considerably affect workers and communities, as well as future jobs and required skills. Planning for a just transition will be critical in managing this process to mitigate negative socioeconomic impacts and increase opportunities associated with the transition, supporting affected workers and communities, and enhancing access to sustainable, inclusive, and resilient livelihoods for all. ADB will support DMCs to undertake transparent and inclusive planning and policies for a just transition that involves all relevant stakeholders and affected groups at all stages of the energy transition.

3) Policy Principle 3: Engaging with Institutions and Framing Policy Reforms

Supporting Institutions

99. Whether focusing on rural electrification, energy efficiency or integrating more renewable energy to the grid, the desired outcomes of policies and plans can only be achieved if DMC institutions and sector utilities and companies are financially healthy, operationally efficient, and their human resources are equipped for the tasks in hand. ADB will continue to help DMCs perform institutional reforms, build capacities, and advance sector restructuring by bringing expertise and best practices to guide the reforms and strengthen energy sector institutions.

100. ADB will help DMCs improve governance and create an enabling environment for sustainable growth by strengthening the quality and capacity of energy sector institutions to undertake policy reforms. In doing so, ADB's energy sector reform activities will be carefully tailored and sequenced to achieve the desired policy outcomes, taking into consideration the political and economic contexts of DMCs. The reforms will target good governance and efficiency of operations, ability to implement and attract investments in the sector by removing price and other distortions, and financial independence and sustainability of the sector utilities and companies. In consequence, the reforms should lead to measurable improvements in energy supply security, quality, affordability, resilience, and environmental sustainability.

101. ADB will encourage the energy sector institutions, utilities, and companies of DMCs to increase diversity and improve gender balance in their workforce by providing equal opportunities for women to serve as employees and advance their careers in the organization. ADB will also support energy sector institutions, utilities, and companies of DMCs to increase their corporate sustainability through introduction or strengthening of internal pollution control and waste policies and procedures, ensuring compliance with national laws and regulations; and strengthening internal labor and health and safety policies and procedures.

102. Addressing energy inequalities and accomplishing the energy transition will also require careful attention to the electricity distribution sub-sector entities and infrastructure. Electricity distribution utilities and companies are the primary contact point to the end-users of electricity, including consumers in the low-income and vulnerable groups. A great share of the deficiencies in service quality needs to be solved at the distribution level. Power distribution also needs to transform and modernize in order to meet the new demands for cooling, e-mobility, smart meters and eventually the internet of things to facilitate energy efficiency and integration of distributed renewable energy sources. ADB will support increased operational efficiencies and commercialization of loss-making distribution utilities. Furthermore, ADB will support introduction of performance-based regulations to incentivize and guide distribution sector natural monopolies to improve its operations.

Subsidy Reform

103. Energy subsidies represent an important policy challenge in the region. Fossil fuel subsidies help governments maintain regulated low prices on their domestic markets regardless of international fuel prices or the economic value of domestic fuels. Subsidies may include direct transfers to fuel companies, tax exemptions, subsidized credit, provision of underpriced public services, and bailing out bankrupt companies of fuel companies from state budgets and other forms of circular debt provisions. The second category is subsidization and cross-subsidization through differentiated electricity tariffs, most commonly provided by charging higher rates to large consumers and lower rates to household consumers.

104. Fossil fuel subsidies create market distortions, both across and within sectors, that