SECTOR ASSESSMENT: ENERGY

A. Introduction

1. This sector assessment is part of the country assistance program evaluation (CAPE) for Sri Lanka. It covers the Asian Development Bank (ADB) strategy and program of assistance for the energy sector from 2006 to 2015. The assessment aims to provide lessons learned and suggestions for ADB operations to consider in developing the country partnership strategy for 2017–2021.

B. Sector Context and Government Plans

2. The Sri Lanka energy sector has seen substantial improvement in the six years since the end of the country’s civil conflict. National electricity access increased from 66% in 2006 to 98% in 2015. Yet despite this enormous progress, the power system is delicate. It lacks the necessary redundancies\(^1\) that power systems need to operate efficiently and continuously without rolling blackouts. And while the national electrification rate is 98%, with some provinces having achieved 100% electrification, the conflict-affected Northern and Eastern provinces have 92% and 94% electrification. The rate is 95% in Uva and North Central provinces, with several districts falling behind this level.

3. Sri Lanka is now focused on electrifying isolated and remote locations, further moderating technical transmission and distribution losses, and operating utility services effectively without sufficient cost of service revenues. The sector has experienced limited off-grid renewable energy,\(^2\) as the energy utility aims to reach most of the country through the national grid. While there is political commitment for full-scale renewable energy solutions, transformation to a power sector fueled by diverse and clean sources remains challenged by other factors, discussed in more detail below.

4. Electricity use per capita grew to 514 kilowatt-hours (kWh) per person in 2015, from 141 kWh per person in 1990.\(^3\) While this growth reflects both rising incomes and increased access, growing demand means that generation, transmission and distribution infrastructure, and service delivery must keep pace. It will be difficult, if not impossible, for Sri Lanka to further develop the energy sector and expand use with only public sector investments.

5. Private sector investment and public–private partnerships will be needed to further sector development and increase inclusive economic growth based on access to electricity. The Electricity Act 2009 allows private sector to invest in generation capacity of up to 25 MW but government ownership of 51% is required for higher amounts, which may deter future investment in the sector.

6. Sri Lanka’s primary energy resources are biomass, petroleum, hydroelectricity and coal. Energy from biomass is predominantly used by households and industry and accounts for 42% of the country’s energy supply (footnote 4). In 2010, about 76% of the population of Sri Lanka, mainly in rural areas, depended on fuelwood and other forms of biomass for energy needs. Small and medium-sized enterprises, such as brick and tile manufacturers, tea and rubber processing industries, use biomass, largely fuelwood, for their energy needs. Fuelwood is usually harvested from forests, often in an unsustainable manner. Rubber wood is an important source of fuelwood and a renewable resource.\(^4\)

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\(^1\) Systematic and asset-based engineering requirements that keep a system operable despite one or more failures to one or more parts of the system. It is vital to operations and service delivery reliability.

\(^2\) Various off-grid renewable energy pilot projects have been successfully underway providing off grid electricity to remote households, including a pilot hybrid mini-grid system sub-project on Elevaithivu Island under ADB’s regional technical assistance Effective Deployment of Distributed Small Wind Power Systems in Asian Rural Areas (TA 7485).


\(^4\) Asia Biomass Energy Cooperation Promotion Office (www.asiabiomass.jp).
7. Petroleum and petroleum products account for 38% of Sri Lanka’s energy supply and are imported. Domestic retail petroleum prices are controlled by the government. Domestic petroleum demand in 2013 was about 3.6 million tons, of which roughly one half was met from locally refined imported crude oil. The remainder was imported as refined products (footnote 4). The demand for refined petroleum products such as gasoline and diesel grew by about 3.2% a year over the study period, with gasoline demand almost doubling. At the same time, demand for kerosene, naphtha and furnace oil fell by an average of 3.3% per year.\(^5\) Gasoline and diesel were used primarily for transportation, while kerosene was used for lighting and naphtha and furnace oil for power generation.

8. The main indigenous sources of electricity in Sri Lanka are hydropower and other renewables, such as wind, and they account for 15% of Sri Lanka’s energy supply (footnote 4). However, hydropower potential is limited in Sri Lanka and substantial shortages in hydropower generation arise during periods of below-average rainfall. As a result, the rapid growth in electricity demand required an increase in oil-fired thermal generation to supplement existing hydropower sources. The increased generation came from independent power producers fueled by imported oil, which were first introduced in 1996. By 2013, oil-fired thermal generation accounted for almost 17% of total generation.\(^6\) In 2011, coal contributed 9% to the primary energy mix with the commissioning of the first coal-fired power plant in that year. Coal use increased to 12% in 2012, and 26% in 2014. Thus, during the last two decades, the electricity generating system has changed from a predominantly hydroelectric to a mixed hydro–thermal system.

9. Challenges. The key challenges facing Sri Lanka’s energy sector are ensuring that the power sector is independently operated and regulated with adequate tariff schemes allowing full cost of service recovery; reconciling renewable energy scale-up with least-cost long-term investment planning in the current environment of low-priced oil and coal; and creating space for private sector investment in the sector.

10. Sector governing bodies. Sri Lanka’s energy sector is predominantly based on public sector investments. Two major ministries are central to future success in the sector. The Ministry of Petroleum Resources Development (MPRD) is responsible for upstream and downstream activities of the petroleum sector. Its policies and the development of the petroleum sector, like the power sector, is important to the country’s energy security. It is the policy-making and chief accounting body of the Ceylon Petroleum Corporation which is responsible for carrying out all the commercial activities related to importing, refining, blending, storing, distributing, and retailing petroleum products in Sri Lanka.\(^7\) The Ministry of Power and Renewable Energy (MOPRE) is responsible for formulating policies, programs, and projects related to power and renewable energy. The Ceylon Electricity Board (CEB) is a corporate body under the MOPRE charged with the responsibility of generating, transmitting and distributing electricity to reach all categories of customers nationwide. The CEB is supervised by MOPRE, and the Public Utility Commission of Sri Lanka (PUCSL).\(^8\) Lanka Electricity Company Limited (LECO) is a private company that handles nearly 10% of total distribution. The PUCSL is the power regulator; however, it lacks full autonomy. Its regulations and administrative determinations are not implemented without review and approval by MOPRE.

11. In 2011, not long after the PUCSL became operational by law, it issued a tariff determination after a regulatory administrative process, to increase the CEB’s tariff so that it better reflected the cost of actual service. However, the tariff was not enforced and revenues remained short of what was necessary.

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\(^8\) The PUCSL was created by the enactment of the Public Utilities Commission Act No. 35 of 2002 and the enabling Electricity Act No. 20 of 2009.
needed to cover costs. The estimated subsidy to the CEB needed to support the government’s tariff was SLRs 11.7 billion (about $105.8 million) for 2011. The PUCSL did not announce a specific mechanism to secure the subsidy, and no subsidy was paid to the CEB (footnote 4). The situation worsened in 2012 because of a severe drought, with no tariff adjustments, the CEB deficit in 2012 grew. The reverse happened in 2013 and the CEB announced that the savings in 2013 would be used to settle fuel bills for 2011 and 2012. Exact amounts, per cost center, of the CEB’s financial cost, revenues, and losses are unclear because of lack of transparency attributed to bundled electricity services.

12. **Government plans.** Through the 2008 National Energy Policy and Strategies (NEPS), the government aims to (i) provide basic energy; (ii) ensure energy security; (iii) promote energy efficiency and conservation, and the use of indigenous resources; (v) adopt an appropriate pricing policy; (vi) enhance sector management capacity; (vii) protect consumers; (viii) enhance quality of service; and (ix) prevent adverse environmental impacts.

13. There is a 10-year development framework to implement the NEPS that identified a set of investments needed to achieve NEPS outcomes. The investment program includes (i) a target 10% of total generation to come from renewable energy by 2015, and 20% by 2020; (ii) a 12% target for transmission and distribution energy losses (the sum of technical and commercial losses) by the end of 2015; (iii) a move to electricity tariffs that are comparable with those in other countries and sufficient for utility viability; (iv) a moratorium on oil-based power plants until 80% of electricity is supplied by non-oil based fuels (coal and renewable energy); and (v) petroleum-based fuels price regulation, limited to petroleum products marketed in a noncompetitive environment. In 2013, the government published a short-term investment strategy for 2014–2016, where the major highlights for the electricity sector were a new focus on the private sector to undertake small-scale renewable energy projects; and awareness creation of energy conservation and energy efficiency improvements.

C. **ADB Sector Strategy and Portfolio**

1. **ADB Strategy**
   a. **Corporate Strategy**

14. ADB’s overarching Long-Term Strategic Framework for 2001–2015 prioritized electrification and renewable energy investments in rural areas, but mandated that actual energy priorities be based on country strategies and programs. Under this framework, ADB sought to focus on energy and the environment to achieve solutions to climate change challenges. ADB also committed to take advantage of synergies among energy sector climate change solutions and solutions proffered by other sector operations. This invoked a cross-sector strategic emphasis on environmental sustainability.

15. ADB’s Long-Term Strategic Framework for 2008–2020 (Strategy 2020) identifies infrastructure, including energy, as one of the five core areas for ADB investment. It explicitly states

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9 To pay its bills, the CEB resorted to a mix of short-term borrowing; and not paying its fuel bills to the petroleum supplier, CPC.
that for the purpose of meeting growing energy demands in a sustainable manner, ADB will support the expansion of the energy supply and promote energy efficiency through supply-side (i.e., generation, transmission, or distribution) and demand-side measures.

16. The midterm review of Strategy 2020 found that ADB had closely aligned its operations with the Strategy’s three complementary development agendas: (i) inclusive growth, (ii) environmentally sustainable growth, and (iii) regional integration. As part of ADB’s support for achieving inclusive growth, Strategy 2020 emphasized investment in infrastructure to achieve high sustainable economic development, connect the poor to markets, and increase their access to basic productive assets.

b. ADB Sector Strategy

17. The revised Energy Policy prepared in 1995 and updated in 2000 stated that ADB would finance both energy infrastructure and advisory support based on a broad range of thematic objectives (economic growth, social development, environmental sustainability, and private sector development). The policy was updated in 2009.

18. The 2009 Energy Policy requires energy operations to be aligned with ADB’s overall strategy, which emphasizes energy security, a transition to a low-carbon economy, universal access to energy, and achieving ADB’s vision of a region free of poverty. One of the principles of the policy’s implementation is the provision of energy to communities and groups with no access to its economic and social benefits. ADB has also emphasized public–private partnerships to enhance energy sector efficiency by increasing competition and investable resources.

c. Country Partnership Strategy

19. Country strategy and program, 2004–2008. In the country strategy and program (CSP), 2004–2008, ADB aimed to (i) help develop a framework for ownership and management to ensure adequate amounts of electricity at economic and affordable prices; (ii) promote and participate in power generation projects; (iii) provide continuing support for transmission and distribution investment, particularly if it underpins important sector reforms; (iv) assist rural electrification; (v) improve the financial viability and management of power companies via an appropriate tariff policy, rate of return on capital, and self-financing ratio; (vi) ensure that the tariff structure is reasonably close to the actual cost of service to each major consumer category, with minimum cross subsidies; (vii) support reforms that will increase the operating efficiency of the sector; and (viii) address structural distortions in the petroleum sector. In ADB’s CSP update, 2005–2006, it added the objective of helping to develop power sector and petroleum sector structures that ensure adequate amounts of electricity and petroleum products at economic and affordable prices. In the CSP update, 2006–2008, it added a condition for ADB’s future engagement in the sector, which was the requirement for a clear policy direction that was in line with ADB’s Power Sector Development Program.

20. Country partnership strategy, 2009–2011. ADB’s CPS, 2009–2011, prepared in 2008, focused on two pillars: (i) strengthening the investment climate, and (ii) achieving socially inclusive development. Assistance to the energy sector was to strengthen the investment climate by supporting investment in transmission and distribution systems, such as the upgrading of electrical substations in the Colombo area. The CPS also provided for an extensive TA program to support the implementation of the government-initiated regulatory reforms that would attract private sector investment to the power sector and improve energy efficiency. To achieve socially inclusive development, the CPS was to

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support the provision of electricity to all poor regions of the country through rural electrification. Power transmission and distribution in Eastern Province was to be a major component of ADB’s assistance in the sector. Energy sector outcomes expected in the CPS included (i) improved provision of electricity to remove constraints on achieving the goal of 8.5% economic growth by 2010; and (ii) increasing rural electrification to improve the quality of life in lagging regions.

21. In the thematic areas, ADB was to support governance by assisting the government’s plans to introduce decentralized delivery in government agencies, such as the CEB. With a new regulatory regime that was to be launched under the Sri Lanka Electricity Act No. 20, ADB intended to redirect its support from development of the regulatory framework to its implementation. To ensure effective regulation and support the CEB’s efficiency improvement efforts, ADB was to provide TA for building the capacity of the PUSCL and implementing the CEB’s internal reform measures.

22. To address issues regarding environment and natural resource management, such as pollution and climate change, ADB was to assess ways to reduce the environmental impact of using coal to generate power. ADB was also to assist the CEB in reducing wasteful energy demand by supporting energy-efficiency improvements by (i) financing the strengthening of the transmission network to avoid system collapses and to meet reliability criteria; and (ii) support the government’s distribution-loss reduction and demand-side management programs, mainly through TA.

23. To promote private sector development, ADB was to promote private sector investment in renewable energy projects by (i) funding transmission projects to remove grid constraints on absorbing additional capacity from renewable energy sources; (ii) providing capacity-building assistance to the Sustainable Energy Authority (SEA) and the PUSCL; and (iii) financing individual clean energy projects on a public-private participation basis.

24. In terms of gender, the CPS provided for gender to be mainstreamed in all ADB operations. However, the CPS provided no details of how this could be done with respect to operations in the energy sector.

25. **Country partnership strategy, 2012–2016.** The CPS, 2012–2016, was to focus on three pillars: (i) inclusive and sustainable economic growth, (ii) catalyzing private investment and enhancing the effectiveness of public investment, and (iii) human resource and knowledge development. In the energy sector, the CPS was to support the government’s goal of providing high-quality and reliable power supply to the entire population by 2012. ADB’s assistance was to focus on renewable energy development (including wind and other clean energy sources), energy efficiency improvement, the transmission and distribution system, and improving energy access for lagging regions. ADB was to work with the government in reducing system losses through improved metering efficiency and better management systems and in creating an enabling environment for clean power development, particularly through public–private partnerships. ADB was to pursue sector reforms, including accelerating unbundling of the power system and greater private sector participation. Assistance to the energy sector essentially supported CPS’s first two pillars.

26. In terms of thematic areas, the CPS suggested that environmental sustainability would be improved by strengthening country safeguard systems, and through direct interventions to support climate change adaptation. However, the energy sector was not mentioned in this regard, although ADB’s assistance was to focus on renewable energy development and energy efficiency improvement that addressed climate change issues. Gender equity was to be promoted by designing projects that were gender-inclusive and emphasized gender empowerment, including infrastructure sectors such as energy. Regional cooperation was to be explored in all interventions, especially in the energy sector and in climate change initiatives.
27. **Interim country partnership strategy, 2015–2016.** The current interim CPS, 2015–2016 includes the agriculture and natural resource sector as a sector of strategic focus, but also retains the other priority sectors and strategic focuses in the CPS, 2012–2016. Therefore, there were no changes made to ADB’s strategic focus in the energy sector. Adjustments to ADB’s strategy will be made in the CPS, 2017–2021 to align it with the government’s new 6-year development program.

2. **ADB’s Energy Sector Portfolio**

28. **ADB loans and grants.** During 2006–2015, ADB approved 10 sovereign loans and grants to the energy sector for four projects, totaling $563.5 million. Another four loans and grants, comprising three projects for $133.5 million, were approved before 2006 but were ongoing during 2006–2015.20 Approved and ongoing loans and grants totaled $697 million. ADB’s allocation to the energy sector was the third largest after transport, and water and urban infrastructure services, and accounted for about 19% of total assistance (including TA projects) during 2006–2015. Table 1 lists ADB loans and grants to the energy sector during 2006–2015.

29. The Power Sector Development Program, approved in 2002, accounted for 19% of total ongoing loans and grants to the energy sector over 2006–2016. The expected outcomes of the program’s components were three-fold: (i) to enhance sector efficiency by introducing competition and commercialization; (ii) to encourage private sector participation in the power subsector; and (iii) to collect adequate revenue for operation, management, and expansion. The expected outcome of the project components was improvement in the quality and quantity of electricity supply by expanding, modernizing, and rehabilitating transmission and distribution systems and expanding the rural network.

Table 1: Approved and Ongoing ADB Loans and Grants in the Energy Sector, 2006–2015

<table>
<thead>
<tr>
<th>Loan/Grant Number</th>
<th>Project Title</th>
<th>Fund Source</th>
<th>Amount ($ million)</th>
<th>Date Approved</th>
<th>Closing Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>3146</td>
<td>Green Power Development and Energy Efficiency Improvement Investment Program – Tranche 1</td>
<td>ADF</td>
<td>29.0</td>
<td>29 Jul 14</td>
<td>31 Mar 20</td>
</tr>
<tr>
<td>3147</td>
<td>Green Power Development and Energy Efficiency Improvement Investment Program – Tranche 1</td>
<td>OCR</td>
<td>121.0</td>
<td>29 Jul 14</td>
<td>31 Mar 20</td>
</tr>
<tr>
<td>2892</td>
<td>Clean Energy and Network Efficiency Improvement</td>
<td>OCR</td>
<td>100.0</td>
<td>18 Sep 12</td>
<td>30 Jun 17</td>
</tr>
<tr>
<td>2893</td>
<td>Clean Energy and Network Efficiency Improvement</td>
<td>ADF</td>
<td>30.0</td>
<td>18 Sep 12</td>
<td>30 Jun 17</td>
</tr>
<tr>
<td>0303</td>
<td>Clean Energy and Network Efficiency Improvement</td>
<td>CEF-CEFPF</td>
<td>1.5</td>
<td>18 Sep 12</td>
<td>30 Jun 17</td>
</tr>
<tr>
<td>2733</td>
<td>Sustainable Power Sector Support</td>
<td>OCR</td>
<td>110.0</td>
<td>27 Jan 11</td>
<td>30 Oct 16</td>
</tr>
<tr>
<td>2734</td>
<td>Sustainable Power Sector Support</td>
<td>ADF</td>
<td>10.0</td>
<td>27 Jan 11</td>
<td>30 Oct 16</td>
</tr>
<tr>
<td>0149</td>
<td>Clean Energy and Access Improvement (change in funding source from ACEF to CCF)</td>
<td>CCF</td>
<td>2.0</td>
<td>6 Oct 09</td>
<td>20 Aug 15</td>
</tr>
<tr>
<td>2518</td>
<td>Clean Energy and Access Improvement</td>
<td>OCR</td>
<td>135.0</td>
<td>14 Apr 09</td>
<td>31 Dec 16</td>
</tr>
<tr>
<td>2519</td>
<td>Clean Energy and Access Improvement</td>
<td>ADF</td>
<td>25.0</td>
<td>14 Apr 09</td>
<td>31 Dec 16</td>
</tr>
<tr>
<td>0149</td>
<td>Clean Energy and Access Improvement</td>
<td>ACEF</td>
<td>2.2</td>
<td>14 Apr 09</td>
<td>20 Aug 15</td>
</tr>
<tr>
<td>9077</td>
<td>Post-Tsunami Utility Connections for the Poor</td>
<td>JFPR</td>
<td>2.0</td>
<td>14 Oct 05</td>
<td>25 Jul 12</td>
</tr>
<tr>
<td>9045</td>
<td>Power Fund for the Poor</td>
<td>JFPR</td>
<td>1.5</td>
<td>4 Jul 04</td>
<td>29 Aug 12</td>
</tr>
<tr>
<td>1929</td>
<td>Power Sector Development Program</td>
<td>OCR</td>
<td>60.0</td>
<td>31 Oct 02</td>
<td>30 Aug 06</td>
</tr>
</tbody>
</table>

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20 Two of the three projects are Japanese Fund for Poverty Reduction grants totaling $2.5 million.
30. The Power Fund for the Poor, approved in 2004, was a Japanese Fund for Poverty Reduction (JFPR) funded project that aimed to allow poor households in rural areas to benefit directly from the electrification of their villages by removing institutional and financial obstacles to connecting to the grid. The project was a revolving fund to enable poor households to access funds to amortize the upfront costs of connecting to the grid. The Post-Tsunami Utility Connections for the Poor Project, another JFPR project approved in 2005, was to provide microfinance to tsunami-affected poor households as upfront capital for piped water and electrification of their homes.

31. The Clean Energy and Access Improvement Project, approved in 2009, accounted for 23% of total loans and grants provided to the energy sector. Its three components are: energy efficiency improvement, renewable energy development, and access for the poor. The energy efficiency improvement component includes (i) system control modernization; (ii) transmission system strengthening; (iii) distribution substations augmentation; (iv) demand-side management for municipal street lighting; and (v) consulting services. The renewable energy development component comprises network capacity augmentation for renewable energy projects. The access for the poor component includes transmission system strengthening and rural household connections.

32. The Sustainable Power Sector Support Project, approved in 2011, accounts for 17% of total loans and grants to the energy sector and has three components: (i) transmission system strengthening to improve reliability and enable rural electrification in Eastern, North Central, Southern, and Uva provinces; (ii) rural electrification and distribution system improvement in Eastern and Uva provinces to expand access for the poor and rural households; and (iii) energy efficiency improvement and renewable energy development.

33. The Clean Energy and Network Efficiency Improvement Project, approved in 2012, accounts for 19% of total loans and grants to the energy sector and comprises three components: (i) transmission infrastructure; (ii) network efficiency improvements; and (iii) pilot solar rooftop power generation projects in the Eastern, North Central, Central, Northern, Southern, and Western provinces of the country.

34. The Green Power Development and Energy Efficiency Improvement Investment Program, tranche 1, approved in 2014, accounts for 22% of total loans and grants to the energy sector. Tranche 1 included construction of (i) a 30-MW, run-of-river hydropower plant; (ii) four grid substations and associated lines; (iii) 33 kV lines and gantries in Eastern and North Western provinces; and (iv) demand-side management pilot projects in Colombo. Nonphysical outputs included capacity building and project management for future investments and supervising implementation of tranche 1.

35. **ADB technical assistance.** ADB approved 10 TA projects during 2006–2015 for a total of $10.05 million. Table 2 lists the energy sector TA projects approved during 2006–2015.
Table 2: Approved ADB Technical Assistance in the Energy Sector, 2006–2015

<table>
<thead>
<tr>
<th>TA Number</th>
<th>TA Title</th>
<th>TA Type</th>
<th>Fund Source</th>
<th>Amount ($'000)</th>
<th>Date Approved</th>
<th>Closing Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>8798</td>
<td>Improving Project Readiness and Portfolio Management</td>
<td>CD</td>
<td>TASF</td>
<td>1,000</td>
<td>15 Dec 14</td>
<td>31 Dec 18</td>
</tr>
<tr>
<td>8167</td>
<td>Capacity Building for Clean Power Development</td>
<td>CD</td>
<td>TASF</td>
<td>900</td>
<td>18 Sep 12</td>
<td>28 Jul 15</td>
</tr>
<tr>
<td>7837</td>
<td>Clean Energy and Network Efficiency Improvement</td>
<td>PP</td>
<td>TASF</td>
<td>1,000</td>
<td>20 Jul 11</td>
<td>29 May 14</td>
</tr>
<tr>
<td>7778</td>
<td>Implementation of Energy Efficiency Policy Initiatives</td>
<td>CD</td>
<td>ACEF</td>
<td>1,850</td>
<td>27 Jan 11</td>
<td>30 Oct 14</td>
</tr>
<tr>
<td>7363</td>
<td>Sustainable Power Sector Support II</td>
<td>PP</td>
<td>JSF</td>
<td>800</td>
<td>13 Oct 09</td>
<td>23 Jun 11</td>
</tr>
<tr>
<td>7265</td>
<td>Capacity Development for Power Sector Regulation</td>
<td>CD</td>
<td>TASF</td>
<td>1,000</td>
<td>14 Apr 09</td>
<td>30 Nov 12</td>
</tr>
<tr>
<td>7266</td>
<td>Rural Household Connection</td>
<td>CD</td>
<td>JFPR</td>
<td>2,000</td>
<td>14 Apr 09</td>
<td>10 Dec 14</td>
</tr>
<tr>
<td>7267</td>
<td>Demand-Side Management for Municipal Street Lighting</td>
<td>CD</td>
<td>CEF</td>
<td>800</td>
<td>14 Apr 09</td>
<td>20 Dec 12</td>
</tr>
<tr>
<td>7011</td>
<td>Building the Capacity of the Sustainable Energy Authority</td>
<td>AD</td>
<td>CEF</td>
<td>600</td>
<td>12 Dec 07</td>
<td>16 Sep 11</td>
</tr>
</tbody>
</table>

ACEF = Asian Clean Energy Fund, AD = advisory, CD = capacity development, CEF = Clean Energy Fund, JFPR = Japan Fund for Poverty Reduction, JSF = Japan Special Fund, PP = project preparatory, TASF = Technical Assistance Special Fund.

Source: Independent Evaluation Department

36. Of the 10 TA projects, six were for capacity development, three were project preparatory, and one was advisory, although it too was largely concerned with capacity development. The Technical Assistance Special Fund financed five TA projects, while other development partners (Asian Clean Energy Fund, Clean Energy Fund, Japan Fund for Poverty Reduction, and Japan Special Fund) financed the remainder. All TA projects except for one have been completed and closed.

D. Evaluation of ADB’s Assistance

37. Overall, energy sector loans and TA projects are rated relevant, effective, efficient, and likely sustainable, with satisfactory impacts. The justification for the ratings is discussed below.

1. Relevance

38. ADB’s energy sector operations are rated relevant as a result of ADB’s successful strategic positioning and the high relevance of the project design. ADB’s CPS energy sector strategy was well positioned and appropriate for Sri Lanka’s needs, development challenges, and priorities. Energy sector projects aimed to be pertinent to applicable development goals and strategies, with both loan and TA projects well designed to achieve measurable results.

a. Strategic Positioning

39. ADB and government development goals. The positioning of the energy sector in ADB’s country strategy is determined by assessing the correspondence between the broad objectives of ADB’s country strategy and the energy sector program and the nature and extent of complementarities and partnerships with other development partners. The overall objective of the CSP, 2004–2008 was based on three pillars: (i) supporting pro-poor growth, (ii) social development, and (iii) improved governance, with support for pro-poor growth as the core pillar for reducing poverty. This objective was to buttress the government’s strategy of achieving high growth and reducing poverty. Development of the energy
sector, particularly the power subsector, was seen as a prerequisite for enhancing growth of gross domestic product, as well as for rural and urban development. An adequate power supply was essential for increased private sector investment in industry and commerce, and the promotion of agro-industrial activity and off-farm employment opportunities. Additional power supply in rural areas would also reduce the use of fuelwood and kerosene for domestic heating and lighting, thus reducing the incidence of respiratory infections, environmental damage, and household energy costs. It also relieved part of the burden of housework for women and improved the environment for after-school home study for students. The focus on the energy sector in the CSP was consistent with the government’s development objectives and highly relevant.

40. The overall objective of the CPS, 2009–2011, was based on two pillars identified in the government’s 10-Year Development Policy Framework: (i) strengthening the investment climate, and (ii) achieving socially inclusive development. The CPS’s energy sector outcomes of improved provision of electricity and increased electricity connection were consistent with these two pillars. Better provision and increased connection of electricity were to help remove one of the major infrastructure constraints, allowing Sri Lanka to achieve the national goal of 8.5% economic growth by 2010. Increasing rural electrification and ensuring a reliable power supply was to contribute to improving the quality of life in lagging regions. ADB was also to play a catalytic role in mitigating climate change by promoting private sector investment in renewable energy projects. ADB support for private sector participation in generation and distribution by providing TA was expected to introduce the public–private partnership approach to improve energy efficiency and finance environmentally sustainable generation projects. The focus of the energy sector in the CPS, 2009–2011, continued to be relevant to ADB’s and the government’s development objectives.

41. The aim of the government’s 10-Year Development Policy Framework (footnote 23) was to accelerate economic growth, improve social indicators, eradicate hard-core poverty, and improve the environment. The Development Policy Framework identified inadequate and poor quality infrastructure as a major constraint on sustaining rapid economic growth and, therefore, planned large infrastructure projects, including projects in the energy sector. The Development Policy Framework envisaged reforms for reducing transmission losses and granting greater financial and managerial autonomy to public sector utilities, such as the CEB. The CPS, 2012–2016 was to support the government’s goal of providing high-quality and reliable power supply to the entire population by 2012 and, therefore, was consistent with the updated 10-Year Development Policy Framework. ADB assistance was to focus on renewable energy development, energy efficiency improvement, the transmission and distribution system, and improving energy access for lagging regions. The focus on the energy sector in the CPS, 2012–2016, reflects continuity in ADB’s operations in the sector since the 1990s. Therefore, the proposed interventions in the energy sector in the CPS, 2012-2016, were relevant to ADB’s and the government’s development objectives.

42. Donor coordination. The three major external assistance agencies active in Sri Lanka since the mid-2000s were: Japan, ADB, and the World Bank. Other sources of external assistance included: Australia, Canada, the People’s Republic of China, the European Union, France, Germany, India, International Fund for Agricultural Development, Republic of Korea, Kuwait, Netherlands, New Zealand, Norway, Nordic Fund, Organization of Petroleum Exporting Countries, Saudi Fund, Sweden, United Kingdom, United States, and several agencies of the United Nations. ADB regularly consulted with the multilateral organizations, including the International Monetary Fund, and the main bilateral agencies. In view of the large proportion of external assistance from Japan and the World Bank, ADB paid particular attention to coordination with these donors to ensure compatibility of policy advice and harmonization of investments.

43. The largest contributions to the energy sector came from Japan, followed by ADB and the World Bank. Assistance also came from the People’s Republic of China (PRC), Germany, Kuwait Fund, Sweden, United Kingdom, and United States, and a smaller amount from the Netherlands. The Japan Bank for International Cooperation’s assistance in the power subsector was formulated closely with the ADB’s Power Sector Development Program\textsuperscript{22} supporting policy and institutional reforms and rural electrification. The Japan Bank for International Cooperation was involved in generation, transmission, and distribution, financed a study for the introduction of liquefied natural gas, and supported the restructuring of the power subsector. The World Bank supported renewable energy in rural areas and restructuring and regulatory aspects of the power subsector. However, the World Bank’s last major loan to Sri Lanka in the energy sector was in 2002 and the project was completed in 2011. Germany’s assistance in the power subsector through Kreditanstalt für Wiederaufbau was in 2004 with support to transmission mainly around Colombo. Donor coordination was generally informal and \textit{ad hoc}. In the mid-2000s, the PRC and Iran emerged as potential development partners in the power subsector.

b. Program Relevance

44. Loan relevance. Evaluation of energy projects approved during 2006–2015 or ongoing from the previous period is constrained by the limited availability of project performance evaluation reports, project completion reports (PCRs) and PCR validation reports. Of the seven projects listed in Table 1, only one has been evaluated to date—the Power Sector Development Program. All other projects are active or ongoing and will be rated for relevance against the overall strategic objectives based on reports and recommendations of the President (RRPs) and TA reports.

45. Its project completion report\textsuperscript{23} rated the Power Sector Development Program \textit{partly relevant}. Rural electrification was in line with the government’s poverty reduction strategy of 2002, and ADB’s own policies supported this effort. Therefore, as a rationale, rural electrification merited ADB intervention on its own. Nevertheless, these factors were not articulated well in the program design. The objectives were not set out coherently because they were defined differently in the main text, program framework, and in other appendixes of the RRP. The links between the impacts, outcomes, and outputs were not demarcated properly between the program and project components and should have been strengthened. The PVR concurred with this assessment and rated the project less relevant. This CAPE energy sector assessment agrees with the project completion report and project validation report rating of \textit{less than relevant}.

46. The JFPR’s Power Fund for the Poor pilot was designed to facilitate poor households’ connections to the newly expanded distribution grid under the Power Sector Development Program project component.\textsuperscript{24} The government’s efforts to extend the geographic coverage of the electricity network resulted in many poor households not taking advantage of the benefits of rural electrification, with less than half of potential poor customers connecting. Poor households were unable to connect largely because they could not finance the up-front connection charges and internal wiring costs. Formal requirements to access loan facilities (such as collateral), transaction costs, and social obstacles tended to restrict poor households from obtaining funding through commercial banks. The Power Fund for the Poor was a pilot project in the form of a revolving fund to remove the institutional and financial obstacles preventing the poor from connecting to the grid. The project was consistent with the government’s development strategy, \textit{Regaining Sri Lanka},\textsuperscript{25} which was based on six main pillars constituting the foundation of its poverty reduction policies: (i) building a supportive macroeconomic environment, (ii) reducing conflict-related poverty, (iii) creating opportunities for the poor to participate

\textsuperscript{22} ADB. 2002. \textit{Report and Recommendation of the President to the Board of Directors: Proposed Power Sector Development Program in Sri Lanka}. Manila.


\textsuperscript{24} ADB. 2004. \textit{Proposed Grant Assistance to Sri Lanka for the Power Fund for the Poor}. Manila.

in economic growth, (iv) investing in people, (v) empowering the poor and strengthening governance, and (vi) implementing an effective monitoring and evaluation system. The project was also consistent with the objective of the country strategy and program, 2004–2008, which was based on three pillars: supporting pro-poor growth, social development, and improved governance, with support for pro-poor growth being seen as the core pillar for reducing poverty.

47. The CSP saw electricity as a prerequisite for rural and urban development. An adequate power supply was also essential in rural areas for reducing the use of fuelwood and kerosene for domestic heating and lighting, thus reducing the incidence of allied respiratory infections for the poor, environmental damage, and household energy costs. It also relieved part of the burden of housework for women. The Power Fund for the Poor Project was therefore considered relevant to the government’s and ADB’s development strategies.

48. Similarly, the objectives of the JFPR Post-Tsunami Utility Connections for the Poor grant was to improve the quality of life of poor households affected by the tsunami by providing access to electricity and water and to make the poor more aware of the use of utility connections. The project was consistent with the government’s development strategy, as articulated in *Regaining Sri Lanka* and the objective of ADB’s CSP, 2004–2008. The development objectives of Post-Tsunami Utility Connections for the Poor were consistent with the government and ADB’s strategies and therefore the project was relevant.

49. The rationale for the Clean Energy and Access Improvement Project was the need to develop clean energy and indigenous renewable energy sources because of the serious threat to the country’s energy security and environment caused by Sri Lanka’s overdependence on imported fossil fuels for oil-fired thermal generation. The proportion of oil-fired generation grew from 1% in 1986 to 58% in 2008. The transmission system was also too weak to meet growing demand in the regions. Despite the government’s investment program to expand the rural distribution network, many poor households remained unconnected, even in areas connected to the grid because they could not afford the initial cost of a service connection. The project was consistent with four out of the nine key policy elements of the 2008 National Energy Policy and Strategies of Sri Lanka: (i) providing basic energy needs, (ii) ensuring energy security, (iii) promoting the use of indigenous resources, and (iv) preventing adverse environmental impacts of energy facilities.

50. The project was also consistent with the 2006 10-Year Development Framework. In terms of ADB’s sector strategy, the project was aligned with one of ADB’s 2009 Energy Policy principles of providing energy to communities with no access to economic and social benefits and with ADB’s CSP, 2004–2008 which supported assistance for rural electrification to provide electricity to the poorer segments of the rural population. In terms of thematic areas, the project’s focus on rural electrification addressed environment and natural resource management by reducing the use of fuelwood and kerosene for domestic heating and lighting. In terms of gender, rural electrification was to relieve some of the burden of housework for women. In sum, the Clean Energy and Access Improvement Project was consistent with the government’s and ADB’s strategies and therefore the project was relevant.

51. The Sustainable Power Sector Support Project was to address the 15% of households—primarily in rural areas—that did not have access to electricity. The lowest electrification ratio among Sri Lanka’s provinces was in Eastern Province where the ratio was 67.3%, below the average national electrification ratio of 85.4% in 2009. Uva Province was a lagging region with an electrification ratio of 70%. There was also an urgent need to develop clean energy and indigenous renewable energy

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sources, reduce losses, and improve energy efficiency. Therefore, the project was to strengthen the 220-kilovolt (kV) transmission line that was vital to the reliability of the transmission system and the evacuation of power from renewable hydropower sources in Central province to the conflict-affected northern part of the country through North Central Province. The project was aligned with the National Energy Policy and Strategies of Sri Lanka, which aimed to supply electricity to 86% of households by 2010 and 98% by 2016 and was consistent with the 2006 10-Year Development Framework, which identified the investments needed to achieve the outcomes of the policy. The project was also consistent with the ADB CPS, 2009–2011, which focused on two pillars: (i) strengthening the investment climate, and (ii) achieving socially inclusive development. Assistance to the energy sector was to strengthen the investment climate by supporting investment in transmission and distribution systems. In order to achieve socially inclusive development, the CPS was to support the provision of electricity to all poor regions of the country through rural electrification. The Sustainable Power Sector Support Project was consistent with the governments and ADB’s strategies and the project was highly relevant.

52. In 2012, with the achievement of a high electrification ratio, the longer-term challenge for the country was to reduce its high dependence on expensive fossil fuel energy. The share of thermal energy in the power generation mix had increased from 6% in 1995 to 54% in 2011. Diversification of the generation mix—including from renewable energy sources, improvement of network efficiency, and supply and demand side management—was seen as a means to address this issue. New infrastructure was needed to support development of clean energy and improvements in transmission and distribution infrastructure was to address electricity needs in the post-conflict areas. The Clean Energy and Network Efficiency Improvement Project29 fitted Sri Lanka’s national and sector priorities, as stated in the Development Policy Framework of 2010 and the National Energy Policy and Strategies. One of the goals of the Development Policy Framework was to reduce the total technical and commercial losses in the network from 14.6% in 2009 to 14.0% by 2012, 13.0% by 2016, and 12.0% by 2020. The project was consistent with ADB’s CPS, 2012–2016 to support the government’s goal of providing high-quality and reliable power supply to the entire population. The Clean Energy and Network Efficiency Improvement Project was relevant to the government’s and ADB’s development objectives.

53. The rationale for the Green Power Development and Energy Efficiency Improvement Investment Program30 was to support the move from dependence on expensive fossil fuel energy for energy security and environmental reasons. Diversification of the generation mix to renewable energy sources, improved network efficiency, reduced technical losses, and supply and demand-side management were needed. The transmission network also needed to be expanded, particularly in former conflict-affected areas in Northern and Eastern Provinces. Projects identified for tranche 1 addressed these issues. Tranche 1 of the program was consistent with Sri Lanka’s national and sector priorities, as stated in the Development Policy Framework of 2010 and the National Energy Policy and Strategies. Three of the objectives of the Development Policy Framework were to: (i) increase the share of grid energy supply from renewable energy sources to 20% by 2020, (ii) reduce total network losses to 12% by 2020, and (iii) increase the percentage of households connected to the grid from 88% in 2010 to 100% by 2012. The project was consistent with ADB’s CPS, 2012–2016 with a focus on renewable energy development, energy efficiency improvement, the transmission and distribution system, and improving energy access for lagging regions. The multitranche financing facility was also consistent with the CPS, 2012–2016 and built on previous ADB interventions in renewable energy development. The Green Power Development and Energy Efficiency Improvement Investment Program was relevant to the government’s and ADB’s development objectives.

54. **Technical assistance relevance.** Of the 10 TA projects in Sri Lanka during 2006–2010, three were project preparatory and their relevance can only be assessed in terms of the projects themselves. Since these projects were rated relevant or highly relevant, the project preparatory TA projects can also be rated relevant. The other seven provided capacity development or advisory TA and are assessed according to their relevance to the government’s and ADB’s energy sector objectives and priorities.

55. The rationale for the TA project, Building the Capacity of the Sustainable Energy Authority, was the need for capacity strengthening for three divisions of the SEA to (i) identify, assess, and inventory renewable energy resources and provide information for improving investment decisions; (ii) publish resource maps and inventories and grant approvals to developers for the use of renewable resources; (iii) explore new resources and link energy chains between them and all possible end users; (iv) design packages of measures to open up the possibilities of using the new resources; and (v) develop policy frameworks and financial instruments to ensure the sustainable development of renewable resources. The TA project was consistent with Sri Lanka’s national and sector priorities, as stated in the 10-Year Development Framework of 2006 and the National Energy Policy and Strategies, specifically, the objective to increase the share of grid energy supply from nonconventional renewable energy sources to 10%. The TA was consistent with ADB’s CSP, 2004–2008, particularly in terms of governance and the effectiveness of public sector management. Therefore, the TA was relevant to the government’s and ADB’s development objectives.

56. The TA projects Capacity Development for Power Sector Regulation, Demand-Side Management for Municipal Street Lighting, and Rural Household Connection were attached to the Clean Energy and Access Improvement Project. The Capacity Development for Power Sector Regulation TA was to help deliver affordable and reliable electricity to consumers through effective regulation of the power sector. The TA was to strengthen regulation through the institutional and technical capacity of the PUSCL and CEB. The Demand-Side Management for Municipal Street Lighting TA was to support utility energy service company units within the CEB and Lanka Electricity Company to implement demand-side management for municipal street lighting. The Rural Household Connection TA aimed to improve electricity access for the poor by supporting the CEB to design a credit support program for rural household connection, select service providers, and build the capacity of stakeholders. The TA projects were consistent with the 10-Year Development Framework of 2006 and the National Energy Policy and Strategies, specifically, to establish an independent regulatory framework and to reduce the total technical and commercial losses of the CEB. The TA projects were also consistent with ADB’s CSP, 2004–2008, particularly in terms of developing government capacity to support independent regulatory bodies and supporting public sector investments to increase the efficiency of the power supply and expand electricity supply, particularly to the poor. The TA projects were relevant to the government’s and ADB’s development objectives.

57. The Implementation of Energy Efficiency Policy Initiatives TA was piggy-backed to the Sustainable Power Sector Support Project, a component of which was involved in energy efficiency. The purpose of the TA was to (i) provide implementation assistance to develop the local expertise and infrastructure necessary for the effective implementation of energy efficiency programs of the SEA, and (ii) conduct field trials and evaluations of energy efficient lighting technology necessary to develop technical guidelines. The TA was consistent with the 10-Year Development Policy Framework of 2010 and the National Energy Policy and Strategies, specifically, to achieve energy savings of 4.3% in 2012, 6.4% in 2016, and 8.7% in 2020 through energy conservation. The TA was also consistent with ADB’s CPS, 2009–2011. The CPS identified the provision of technical assistance for the implementation of energy efficiency measures as one of the focus areas for country assistance. The TA was relevant to the government’s and ADB’s development objectives.

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58. The Capacity Building for Clean Power Development TA was attached to the Clean Energy and Network Efficiency Improvement Project, a component of which was a rooftop solar power generation pilot project. The purpose of the TA was to (i) assist in conducting system stability and network planning studies for integrating intermittent wind and solar power generation into the system, and (ii) support the SEA in developing wind and solar potential on a sustainable basis and attracting the private sector to implement wind and solar power generation. The TA was consistent with the 10-Year Development Framework of 2010 and the National Energy Policy and Strategies, specifically, to increase the share in grid energy supply from nonconventional renewable energy sources from 4.1% in 2007 to 10% by 2016, and 20% by 2020. The TA was also consistent with ADB’s CPS, 2012–2016, where the focus was on renewable energy development, including wind and other clean energy sources, and creating an enabling environment for the clean power development, particularly through public–private partnerships and greater private sector participation. The CPS identified provision of technical assistance for the clean power development as one of the focus areas for country assistance. The TA was relevant to the government’s and ADB’s development objectives.

59. ADB identified several issues that affect portfolio performance, including projects in the energy sector. These included project readiness, executing and implementing agencies’ lack of capacity for restructuring projects, weak project implementation and management capacity of executing and implementing agencies, inadequate capacity of executing agency staff in project performance monitoring and evaluation, lack of knowledge sharing on best practices and innovations across sectors, and inadequate capacity of financial management staff to comply with the fiduciary requirements associated with the projects. The Improving Project Readiness and Portfolio Management TA\(^{32}\) was designed to (i) strengthen the capacity of staff in executing and implementing agencies in project implementation and management; (ii) strengthen the project and portfolio monitoring capacity of executing and implementing agencies and the Ministry of Finance and Planning; and (iii) improve project readiness and performance. The TA was in response to requests by the External Resources Department and the Department of Project Management and Monitoring of the Ministry of Finance and Planning that ADB conduct capacity development programs to enhance project implementation and management capacity of executing agencies and to improve project readiness at entry. The TA was consistent with ADB’s CPS, 2012–2016, which focused on catalyzing private investment and enhancing the effectiveness of public investment and development of human resource and knowledge. The TA was relevant to the government’s and ADB’s development objectives.

60. Relevance rating. Except for one loan project, which was rated less relevant, and one rated highly relevant, all loan, grant and TA projects are rated relevant based on the rationale provided in RRP\$s and TA reports against objectives of the government’s and ADB’s strategies and the development issues identified. Overall, the ADB’s program of assistance over 2006–2015 can be rated relevant.

2. Effectiveness

a. Loan and Grant Effectiveness

61. The Power Sector Development Program was approved in 2002 and closed in 2010. The expected outcomes of the program were assistance for the government to reform and restructure the power sector by developing (i) successor companies to the CEB, (ii) a culture based on commercial terms, (iii) consumer benefits in terms of quality of supply, and (iv) an independent tariff-setting mechanism. The program framework further provided that (i) load shedding would be eliminated by 2004, (ii) system losses would be reduced from about 22% to less than 12% by 2005, (iii) an electrification ratio of 80% would be achieved by 2010, (iv) there would be no applications for electrical connection pending for more than 2 months by 2005, (v) all consumers would be metered by 2003,

(vi) accounts receivable would be at an average of 2.5 months by August 2002, and (vii) the collection-billing ratio would be greater than 99%.

62. After noting that 144,934 households were electrified under the project, 32,000 more than expected, and showing that system losses were reduced from 22% to 13.4%, the project completion report rated the Power Sector Development Program effective in achieving its expected outcomes. However, its rating was based on outcomes from the project component which were not well defined, and no separate rating was provided for the program. The PCR validation report downgraded the rating to less effective after considering both the project and program outcomes. The validation report concluded that, because the government had created functional business units within the CEB, rather than unbundling generation, transmission, and distribution to separate companies, the program was not effective in improving the efficiency of the power sector and had not created an environment conducive to private sector participation. The validation report further concluded that noncompliance with the unbundling requirement was serious enough for the $30 million second tranche of the program component not to be released. This sector assessment agrees with the validation report rating of less than effective.

63. The Power Fund for the Poor Project was approved in 2004 and completed in 2012. This JFPR project aimed to improve the quality of life and reduce rural poverty by improving access to grid-connected electricity. The project was to pilot a microfinance scheme for poor households to amortize the up-front capital costs required for the households to electrify their homes. The implementation of the scheme was to be supported by training and public awareness programs to strengthen the capacity of participating microfinance institutions and the CEB. The achievement of outcomes and outputs cannot be assessed because of the absence of an implementation completion memorandum. Anecdotal evidence and discussions with stakeholders suggests that outcomes and outputs were successfully achieved.

64. The objective of the Post-Tsunami Utility Connections for the Poor Project, approved in 2005 and completed in 2012, was to improve the quality of life of poor households affected by the tsunami by providing them with access to electricity and water and to make the poor more aware of the use of utility connections. The project was funded by JFPR and was expected to provide at least 4,406 grants for electricity connections at the end of the first year and to carry out a public awareness campaign in at least 40 villages. The project had provided 5,768 electricity connections by project completion. The awareness campaign to educate beneficiaries on the sustainable and efficient use of electricity to keep electricity bills affordable was successfully conducted. The implementation completion memorandum concluded that the project was highly successful in improving the living standards of tsunami-affected people.

65. The Clean Energy and Access Improvement Project, approved in 2009 with expected completion by the end of 2016, aimed to provide an affordable and reliable power supply for inclusive economic growth by improving the coverage and service efficiency of the CEB and Lanka Electricity Company. The outputs of the project were to be (i) a stronger transmission and distribution network and demand-side management of municipal street lighting, (ii) removal of network bottlenecks for small hydropower plants, (iii) a stronger transmission network in the Eastern Province, and (iv) an expanded credit support program for service connections in the selected provinces. After gathering up-to-date information from the field, this sector assessment found that most components of the transmission system strengthening are complete and operational. These include four 132 kV transmission lines, four 132 kV/33 kV grid substations, and nine augmentations of grid substations, four of which were financed with loan savings. The demand-side management of municipal street lighting was implemented through TA, as discussed below. Access to power for the poor households component was completed but later

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33 The field mission for this sector assessment included a site visit to the Mahiyangana grid substation where there was evidence of the completed construction and successful operation of the Mahiyangana grid substation, is used to augment the power supply in the Eastern province.
expanded from $3.5 million to $4.7 million from loan savings and is expected to connect another 5,000 households in the south-eastern region of the country. The system control modernization component is still ongoing, but should be completed by the end of 2016. The review’s preliminary assessment of the project is effective.

66. The Sustainable Power Sector Support Project was approved in 2011 with completion expected in late 2016. The expected project outcome was an improvement in the coverage, efficiency, and reliability in the delivery of electricity. Expected outputs were (i) transmission system strengthening; (ii) rural electrification expansion and distribution system improvement; and (iii) energy efficiency improvement and renewable energy development. Most components of the transmission system strengthening are complete and operational. These include three transmission lines and one transmission line augmentation comprising a second string at 220 kV. There were four new grid substations at Galle, Polonnaruwa, Vavunativu, and Monragala and one augmentation at Ampara, with one additional augmentation at Kiribathkumbura funded from loan savings. About 90% of the rural electrification and distribution component is completed and the energy efficiency improvement component is completed. The renewable energy development component is not complete; however, the design of the Moragolla hydropower project has been completed. Commissioning of the Moragolla hydropower project is scheduled for 2020. Additional support under the rural electrification component on improving livelihoods in local communities and provision of free connections to poor households, especially for women, through training on the productive use of microcredit linked to income opportunities emerging with electricity access in Ampara district of Eastern Province was evidenced in the field during the CAPE energy assessment. Given the information to date, the review’s preliminary assessment of the project is effective.

67. The Clean Energy and Network Efficiency Improvement Project, approved in 2012, is expected to be completed in 2017. The project aims to increase the supply of clean power and improve the efficiency and reliability of the delivery of electricity. The expected outputs were: (i) transmission system strengthening in Northern Province; (ii) transmission and distribution network efficiency improvement; and (iii) a rooftop solar power generation pilot project. All components of this project are still being implemented and none has been completed. The design of the 125 kilometer, 220 kV transmission line at Mannar is complete and construction has just begun. Implementation of all the subprojects is on schedule. Given the CEB’s experience and success with ADB projects in transmission and distribution and the absence of implementation issues, it is likely that the project will be effective.

68. The Green Power Development and Energy Efficiency Improvement Investment Program–tranche 1 was approved in 2014 and completion is expected in 2020. The expected outcome was an enhancement of clean power generation, system efficiency, and reliability. The expected outputs were (i) a hydropower generation project; (ii) enhancement of the transmission infrastructure; (iii) improvement of the efficiency of the medium-voltage network; (iv) energy efficiency improvement through demand-side management; and (v) capacity development in CEB. Lot A for one new grid substation and three substation augmentations was tendered and evaluated, and the contract was awarded. Lots B1 and B2 are financed by Agence Française de Développement. Given the early stage of implementation, it is not possible to rate the effectiveness of this project at this time.

b. Technical Assistance Effectiveness

69. The expected outcome of the Building the Capacity of the Sustainable Energy Authority TA, approved in 2007 and completed in 2011, was stronger capacity and more technical knowledge at the SEA to enable it to manage a portfolio of renewable energy projects and create an enabling environment to encourage investments in renewable energy generation capacity. The TA focused on

35 The field mission included a site visit to the Pallekelle Industrial Zone to view a commercial solar rooftop installation under the project. The installed solar roof top was fully operational and functioning as expected.
achieving the following outputs. For component 1 the planned outputs were: meeting short-term targets by producing procedures and manuals for processing renewable energy projects, providing support for application review process, and providing immediate training to staff. For component 2 the planned outputs were: institutional capacity development for the achievement of medium-term objectives, including establishing financial resource requirements and possible sources of funding for 10 years and proposing policy and financial instruments to promote investment in renewable energy projects; institutional strengthening, including job descriptions of senior officers, defining the scope of work and tasks to be outsourced, and preparing a manual on business procedures; and developing transitional plan to manage human resources, preparing and implementing a medium-term capacity development program; and preparing a 10-year action plan for renewable energy development.

70. According to the TA completion report, actual TA outputs met the targets. Under component 1, a detailed manual and guidelines for policies, procedures and approval process to develop renewable energy projects for supplying electricity to the national grid were prepared, resulting in the approval and installation of 102 MW of renewable capacity in 2008–2010. A short-term capacity building program focusing on the application of the new project approval process, economic and financial evaluation of renewable energy projects, and technical training on renewable energy technologies were conducted to strengthen staff capacity to undertake appraisal of project proposals and pre-feasibility reports. Under component 2, a report on financing sustainable energy in Sri Lanka was prepared with recommendations on possible sources of funding and financing instruments, along with a report on biomass. A human resource management plan for the SEA was developed as well and renewable energy policy instruments and action plans were recommended. Institutional development and capacity building was undertaken, including on-the-job training, workshops and thematic seminars on topics such as financing sustainable energy development, human resource management, feed-in-tariffs, and developing wind and biomass energy. A medium-term business plan for 2011–2016 was also prepared and subsequently approved. The quality of outputs was satisfactory and the expected outcome was achieved. The TA was effective.

71. The Capacity Development for Power Sector Regulation TA, approved in 2009 and completed in 2012, was expected to help to deliver affordable and reliable electricity to Sri Lankan consumers through effective regulation of the power sector. The TA was to strengthen regulation of the power subsector through (i) institutional and technical capacity development of the PUSCL to implement the Sri Lanka Electricity Act No. 20, and (ii) institutional and technical capacity development of the CEB to enable it to comply with regulatory requirements under the act. All outputs and outcomes of the TA were successfully achieved. Training activities to develop capacity in specific knowledge areas were conducted. The training was useful and relevant. A tariff methodology was developed and a reorganization of the PUSCL was implemented and staffed. A license information submission system was developed. The TA is rated effective.

72. The expected outcome of the TA project, Demand-Side Management for Municipal Street Lighting, approved in 2009 and completed in 2012, was to establish a utility energy service company to identify and implement energy efficiency projects in the distribution sector. The TA was to (i) assess the optimal type of energy service company units and define their scope of work and responsibilities, (ii) propose financing mechanisms to fund the energy efficiency projects identified by the energy service company units, and (iii) assess capacity building needs and develop training and outsourcing plans. Expected outputs and outcomes of the TA were generally achieved. Energy service company units were established in the CEB and Lanka Electricity Company. The TA assessed the regulatory framework regarding performance contracting and energy service company operations and developed a methodology for establishing a baseline for monitoring energy efficiency savings and monitoring and verification protocols. The CEB and Lanka Electricity Company capacity was enhanced through training on street lighting design and two pilot street lighting projects were implemented. Guidelines for municipal street lighting were prepared. The TA is rated effective.
73. The expected outcome of the TA, Implementation of Energy Efficiency Policy Initiatives, approved in 2011 and completed in 2014, was to increase the energy efficiency of households and industrial and commercial concerns through the implementation of program initiatives of the SEA. It was estimated that when fully implemented these initiatives would result in energy savings of approximately 460 gigawatt-hours, thus avoiding about 354,000 metric tons of carbon dioxide emissions equivalent per year by 2015. The expected outputs from the TA were: (i) establishment of certified appliance testing laboratories for lighting, ventilation, air conditioning and refrigeration products and appliances; (ii) design guidelines and recommended products for energy efficient domestic lighting based on results of lighting device field trials and study; (iii) a strategy report and draft policy for the maximum use of energy efficiency lighting in Sri Lanka, and (iv) training of energy auditors.

74. The TA outputs generally met the targets. These included (i) a lighting testing laboratory and energy efficiency testing laboratory for refrigeration appliances, (ii) design guidelines and recommended products for energy efficient domestic lighting based on results of lighting device field trials and studies, (iii) a strategy report and implementation plan on energy efficient lighting, and (iv) training programs for energy auditors. Design guidelines, strategy and knowledge products were also developed: (i) Lighting Application Guidelines for Residential Sector, (ii) Lighting Tips for Homes, (iii) Lamp Waste Management Strategy and Action Plan for Sri Lanka, (iv) Development of Energy Efficient Lighting Policy for the Residential Sector, and (v) Energy Auditor Manual. All of the outputs contributed to the effective outcome of the TA.

75. The expected outcome of the JFPR TA, Rural Household Connection, approved in 2009 and completed in 2014, was to increase electricity connections for the poor by (i) enhancing the operational efficiency of rural distribution through an output-based performance contract, and (ii) supporting CEB to implement a credit support program for rural household connections. Although the TA is complete, a TA completion report was not yet available during the review and, therefore, it was not possible to rate the TA project’s effectiveness.

76. The expected outcome of the TA, Capacity Building for Clean Power Development, approved in 2012 and completed in 2015, was to increase clean energy generation and economic benefits from greater use of renewable resources and better energy security through reducing reliance on imported fuels. The TA was expected to meet renewable energy targets set by the government, specifically, 10% of energy in the grid to come from renewable resources by 2016 and 20% by 2020 and a reduction in greenhouse gas emissions. The TA is still ongoing and not possible to rate effectiveness.

77. The expected outcome of the TA, Improving Project Readiness and Portfolio Management, approved in 2014 with completion expected in 2018, was improved overall portfolio performance. The TA was to have three outputs: (i) strengthened project implementation and management capacity of executing agency and implementing agency staff; (ii) strengthened project and portfolio monitoring capacity of executing agency, implementing agency, and the Ministry of Finance and Planning; and (iii) improved project readiness and performance. The TA is still ongoing and it is not possible to rate its effectiveness.

78. **Effectiveness rating.** Although most loan projects are in varying stages of implementation, this review suggests that the project will be effective in achieving expected outputs and outcomes. The completed TA projects are rated effective and there seem to be no issues regarding the three ongoing TA projects. Therefore, ADB’s program of assistance over 2006–2015 can be rated effective.
3. Efficiency

a. Loan and Grant Efficiency

79. Assessment of the efficiency of a project is largely based on the calculation of an economic internal rate of return (EIRR) when benefits are well defined.\(^\text{36}\) Process efficiency is also assessed, particularly in cases of policy-based assistance and TA projects.

80. The project completion report rated the Power Sector Development Program less than efficient in achieving outcomes and outputs. The project completion report re-calculated an EIRR of 24% for the project component, yet it looked at the whole program and project component to assess overall efficiency. The PCR validation report concurred with this approach and rating. The project completion report and the validation report assessed the efficiency of the program component in terms of achieving program outcomes and outputs. Both reports found that, while the project component passed the economic efficiency test, the program component failed so miserably that the two taken together proved less than efficient. The current energy sector assessment found that the rationale used by the project completion and validation reports to assess the project’s program component was consistent with ADB’s Guidelines for the Economic Analysis of Projects,\(^\text{37}\) hence, the program was less than efficient.

81. Efficiency in achieving outcomes and outputs for the Power Fund for the Poor project cannot be assessed because of the absence of an implementation completion memorandum.

82. The Post-Tsunami Utility Connections for the Poor Project was implemented efficiently with a completion delay of three months because of delays in final payments to suppliers, shortages and non-availability of some materials and equipment, and security problems in some eastern regions.

83. Since the Clean Energy and Access Improvement Project, the Sustainable Power Sector Support Project, the Clean Energy and Network Efficiency Improvement Project, and the Green Power Development and Energy Efficiency Improvement Investment Program are not yet complete, no estimates of EIRRs are available. However, given that transmission and distribution enhancement components were developed on the basis of an optimized system expansion plan, these components can be deemed least-cost and therefore efficient. Lower than expected prices on international markets for transmission and distribution equipment meant that additional investment could be made in the power system with the same amount of resources, indicating that project benefits were higher than initially expected at appraisal. Moreover, project implementation was largely on schedule and faced few implementation issues. This also supports the view that the projects were efficient.

b. Technical Assistance Efficiency

84. The TA for Building the Capacity of the Sustainable Energy Authority was implemented without any major issues. However, at inception, it was envisaged that a 10-year action plan for SEA would be developed through an in-house exercise with the assistance of a consultant to ensure capacity building through learning by doing and staff ownership. However, the SEA had difficulties in filling positions, including those of some senior officers due to the uncompetitive government salary, and it therefore considered proceeding to recruitment of new staff on a contract basis to fill vacancies. As a result, the


\(^{37}\) ADB’s Guidelines for the Economic Analysis of Projects provide that the main difference between directly productive and indirectly productive projects for economic analysis is in the valuation of project outputs and effects. In the case of indirectly productive projects, the best that can be expected is to be able to value project effects indirectly, in terms of the project’s impact on the market value of the product for which the project produces an intermediate input or on the cost of an alternative in terms of cost savings. Contingent valuation and benefit transfer techniques are also useful in quantifying and valuing, the outputs and effects of indirectly productive projects. For more details, see ADB. 1997. Guidelines for the Economic Analysis of Projects. Manila. pp. 57–60.
terms of reference were redefined to focus on preparing (i) a biomass investment program, and (ii) a medium-term business plan. This resulted in the expected outcomes being achieved without implementation delays. According to the SEA, it benefited substantially from the TA and staff trained under the TA are executing their roles effectively. The TA is rated efficient.

85. The Capacity Development for Power Sector Regulation TA was efficient, with an implementation delay of only 10 months. The delays were a result of extended contract negotiations (5 months) and final contract payment (5 months). The TA also required 10% more in consultant input in terms of time than originally envisaged.

86. Implementation of the Demand-Side Management for Municipal Street Lighting TA was delayed by 27 months because of delays in the implementation of the two pilot projects. This meant that more than two years of benefits of the TA were postponed, reducing the overall economic return of the TA investment. The costs of the pilot projects were also higher than anticipated because of the small scale of the projects and the absence of economies of scale for equipment suppliers and higher shipping costs. Nevertheless, since the projects were on a pilot basis, efficiency was expected to suffer as a result of learning new technologies. Therefore, the TA is rated efficient.

87. There were no major issues during the Energy Efficiency Policy Initiatives TA; all inputs and activities were implemented as planned. The TA completion date was extended from 30 April 2013 to 30 October 2014 (18 months) to (i) allow for initial delays in design, manufacturing, delivery and installation of an energy efficiency testing laboratory for refrigeration appliances, (ii) accommodate the monitoring period prior to the conduct of the required post-installation survey for energy efficient lighting devices, (iii) complete training of energy auditors and specialized training on lighting standards and laboratory procedures, and (iv) complete payments under the TA. The TA completion report rated the TA efficient.

88. The completion report for the Rural Household Connection TA is being prepared, so no assessment is available on the TA project’s efficiency. The TA projects for Capacity Building for Clean Power Development and Improving Project Readiness and Portfolio Management are still ongoing. Therefore, there is no assessment available regarding the TA projects’ efficiency.

89. **Efficiency rating.** Although most loan projects are in varying stages of implementation, a review of their implementation and the CEB’s past experience in implementing such projects suggests that the projects will be efficient in achieving expected outputs and outcomes. The completed TA projects are rated efficient and there seem to be no issues regarding the three ongoing TA projects. Therefore, ADB’s program of assistance over 2006–2015 can be rated efficient.

4. **Sustainability**

a. **Loan and Grant Sustainability**

90. The project completion report rated the Power Sector Development Program likely sustainable because the existing human, institutional, financial, and other resources were “sufficient to maintain the outcome achieved over the economic lifetime of the project”. However, the PCR validation report’s view was that the achievements of the program component may be sustainable, if the government is willing to allow CEB the freedom to operate according to its best interests and to allow the regulatory authority autonomy in its decision making. The project completion report did not calculate a financial internal rate of return for the project component or provide a financial analysis of the CEB to assess the sustainability of the project component and the operating agency itself. Therefore, the project validation report concluded that it was not possible to validate the likely sustainable rating for the overall program.
91. This energy assessment concurs with the validation report, and finds that it is possible to argue that the project component of the Power Sector Development Program is sustainable given the evidence of growing electrification (discussed in para. 2 of this report), and the lack of evidence of decreasing rural electrification in the country. Yet, without a financial internal rate of return recalculation at project component completion, there is no specific evidence to demonstrate the sustainability of project component outcomes and outputs. Further, the program component expired without achieving the envisaged outcomes. Hence, the program component, in the absence of any documentation of direct benefits (e.g., CEB revenue improvements resulting from partial restructuring), provides nothing to enable the sustainability of the Power Sector Development Program to be assessed. The sustainability of the outcomes and outputs for the Power Fund for the Poor Project cannot be assessed because of the absence of an implementation completion memorandum.

92. The Post-Tsunami Utility Connections for the Poor Project was rated sustainable because beneficiaries were made aware of the safe use of electricity and how to manage usage levels. The implementation completion memorandum stated that beneficiaries were observed to be managing usage and paying their bills on time.

93. The sustainability of ongoing projects—the Clean Energy and Access Improvement Project, the Sustainable Power Sector Support Project, the Clean Energy and Network Efficiency Improvement Project, and the Green Power Development and Energy Efficiency Improvement Investment Program—depends mainly on the financial health of the CEB. Without specific costs attributed to generation, transmission, and distribution, it is difficult to calculate accurate financial internal rates of return properly. The CEB’s financial statements could be used to assess sustainability, but these are normally published with a two- to three-year time lag, so an up-to-date assessment of CEB’s financial position is not possible. Nevertheless, the CEB has been operating satisfactorily on a technical level, with load shedding eliminated and system losses reduced. The institutional capacity of the CEB seems to be adequate in terms of engineering and financial management. Further, transmission costs in unbundled electricity systems are often small, up to about 2% of total costs. While distribution costs are about 32% or less of total costs, combined transmission and distribution costs are still much lower than those of power generation (60% or more). With the exception of a small 30 MW run-of-river hydropower project under the Green Power Development and Energy Efficiency Improvement Investment Program, ADB has only funded transmission and distribution projects in Sri Lanka’s power sector in the period 2006 to 2016. Therefore, given the CEB’s power system technical and planning expertise, and the minor cost of transmission and distribution in the overall retail tariff, this review rates these ongoing projects likely sustainable.

b. Technical Assistance Sustainability

94. The TA completion report stated that the outcome of the Building the Capacity of the Sustainable Energy Authority TA project was likely sustainable. However, it provided no justification for the rating. Discussions with the SEA during the preparation of this sector assessment found evidence of outcomes from the TA still in existence and no evidence to counter the likely sustainable rating.

95. The outcomes of the Capacity Development for Power Sector Regulation TA are generally sustainable, according to the TA completion report. The systems developed under the TA are in use, and trainees continue as staff at the PUSCL.

96. The outcomes of the Demand-Side Management for Municipal Street Lighting TA are generally sustainable, according to the TA completion report. Although progress was achieved in promoting

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energy efficiency in municipal street lighting, further assistance may be needed to ensure that the recommendations of the TA are implemented and that the project is sustainable.

97. The TA completion report stated that the outcome of the Implementation of Energy Efficiency Policy Initiatives TA was sustainable. However, the TA completion report provided no justification for the rating. The TA completion report also stated that additional assistance to the government to follow up actions on implementation of TA recommendations was needed to ensure that the impacts of the TA are sustainable.

98. The completion report for the Rural Household Connection TA is being prepared, so no assessment is available regarding the TA’s sustainability. The TA projects for Capacity Building for Clean Power Development and Improving Project Readiness and Portfolio Management are not complete and still ongoing. Therefore, there is no assessment available regarding the TA projects’ sustainability.

99. **Sustainability rating.** Completed loan and TA projects were rated *sustainable*. Ongoing loan and TA projects are rated *likely sustainable* because the CEB has been operating satisfactorily on a technical level and institutional capacity seems to be adequate in terms of engineering and financial management. Therefore, ADB’s program of assistance over 2006–2015 can be rated *sustainable*.

5. **Development Impact**

100. The project completion report rated the Power Sector Development Program impact *significant*. It rated the project component significant and the program component substantial. Despite the program component shortcomings, the project component made a substantial impact. The project completion report states that project component beneficiaries were satisfied with the electricity connections, quality of supply, and service provided by the CEB. Beneficiaries noted improvements in living conditions, such as improved home air quality, reduced health hazards, better community safety, an improved domestic environment for children’s education, and monetary savings from grid electricity. The project completion report also stated that industry started up or improved operations, thus increasing employment opportunities. The PCR validation report found that the project component impact was substantial, while the impact under the program component was negligible. The validation report rated the overall impact of the program as moderate. This energy sector assessment agrees with the validation report.

101. The implementation completion memorandum for the Post-Tsunami Utility Connections for the Poor Project stated that electricity provided by the project helped the poor to improve their standard of living by improving conditions at home for children’s school studies, household economic activities, and safety and health by avoiding the use of kerosene. The cost of living was also reduced, with electricity displacing higher cost kerosene. Although the implementation completion memorandum did not rate development impact, the project seems to have had a significant impact.

102. The development impact of the Power Fund for the Poor Project cannot be assessed because of the absence of an implementation completion memorandum.

103. The development impacts of ongoing projects were not available at the time of writing because implementation was not complete. TA completion reports did not assess or rate the development of TA projects. Therefore, it is not possible to assess the development impact of ADB’s overall program of assistance over 2006–2015.
E. Other Evaluation Criteria

1. ADB Performance

104. The project completion report for the Power Sector Development Program rated the ADB performance *satisfactory*. In supporting the unbundling of the power sector, ADB had a clear strategy and road map and engaged in dialogue with key stakeholders. After the loan became effective, ADB undertook an inception mission, a consultation mission, a midterm review mission, and six other review missions. The project was delegated to the resident mission in 2004. The ADB missions included visits to subproject sites as well as meetings with key CEB project personnel and management. ADB responded quickly and efficiently to effect a scope change that allowed substantial additional work under the project. The PCR validation report concurred with the rating.

105. The implementation completion memorandum for the Post-Tsunami Utility Connections for the Poor Project stated that the resident mission was the executing agency for the project and conducted review missions and attended meetings with the CEB and other participating institutions for feedback and problem solving. It did not rate ADB’s performance.

106. The TA completion reports for the Building the Capacity of the Sustainable Energy Authority, Demand-Side Management for Municipal Street Lighting, Capacity Development for Power Sector Regulation, and Implementation of Energy Efficiency Policy Initiatives stated that ADB closely supervised TA activities and outputs through regular communication with consultants and review missions to assess progress and resolve implementation issues. ADB staff facilitated TA activities, coordinated consultants' field visits, monitored outputs, and provided guidance in the preparation of TA reports. The overall performance of ADB was satisfactory with respect to these TA projects. Overall, ADB performance was satisfactory regarding the program of assistance over the 2006–2015 period, based on completion reports available for loan and TA projects.

2. Borrower and Executing Agency Performance

107. The project completion report for the Power Sector Development Program rated the performance of the borrower and the executing agency *partly satisfactory*. The government failed to implement the unbundling of the CEB. It did not satisfy the conditions for releasing the second tranche and the program was closed in 2005. The performance of the implementing agency (CEB) for the project component was rated satisfactory. The PCR validation report concurred with the *partly satisfactory* rating.

108. The TA completion report for Building the Capacity of the Sustainable Energy Authority stated that the performance of the Ministry of Power and Energy, the executing agency, and the SEA, the implementing agency, was satisfactory. The SEA provided adequate office accommodation and logistical support. The TA completion report for Demand-Side Management for Municipal Street Lighting stated that the executing agencies, the CEB and Lanka Electricity Company, performed satisfactorily. They also provided adequate office accommodation and logistical support. The executing agency for the Capacity Development for Power Sector Regulation TA was the Ministry of Power and Energy and the implementing agency was the PUSCL. Both performed satisfactorily and provided adequate office accommodation and logistical support. The Ministry of Power and Energy was also the executing agency for the Implementation of Energy Efficiency Policy Initiatives TA and the Sustainable Energy Authority was the implementing agency. The TA completion report stated that the SEA provided inputs in terms of an office space and counterpart staff and that performance was generally satisfactory. The overall performance of the executing and implementing agencies was *satisfactory* with respect to the program of assistance over 2006–2015.
F. Summary of Findings, Lessons, and Recommendations

109. ADB loan and TA support to the energy sector in Sri Lanka was relevant, effective, efficient, and likely sustainable. The focus of the program lending assistance for 2006 to 2015 was to support the government’s goal of providing high-quality and reliable power supply and access to electricity by all households. This support allowed investment to improve Sri Lanka’s transmission and distribution system. However, due to the delicacy of the system and the difficulty that newly connected poor households may face, additional support to the transmission and distribution subsectors, with some continued microcredit scheme for poor households, continues to be needed.

1. Key Findings

110. ADB loan and TA support to the energy sector in Sri Lanka was relevant, effective, efficient, and likely sustainable. The provision of TA was successful in building capacity in CEB and other government agencies. ADB provided guidance and advice when needed to ensure the successful implementation of the lending and TA programs and executing and implementing agencies took ownership of projects, thereby contributing substantially to project successes. Overall, ADB support is rated successful.

111. The focus of ADB’s program of lending assistance for 2005–2016 was to support the government’s goal of providing a high-quality and reliable power supply and access to electricity by all households. This objective will be achieved by 2016 with investment support to Sri Lanka’s transmission and distribution system. This support allowed investment to improve energy efficiency and provide access to electricity by the population, especially in the rural and remote areas. ADB’s assistance also focused on renewable energy development, including hydropower and solar. Support for solar power pilot projects demonstrated that solar energy is technically and financially viable with a capital subsidy. However, its economic viability has not yet been confirmed. ADB’s pursuit of energy sector reforms and the restructuring of CEB were less than successful. While some restructuring was achieved, the impact of these changes on economic and institutional efficiency in the energy sector was muted.

112. The TA program of assistance to Sri Lanka focused mainly on capacity building in the PUSCL and the SEA. The objectives of the TA projects were generally achieved. However, TA may still be needed, particularly in the policy area and knowledge support for sector restructuring and renewable energy. There is a need to increase awareness of the benefits of decentralizing the power subsector, the organizational options available for restructuring CEB, and the benefits of increased investment by the private sector. The role of renewable energy in Sri Lanka still needs to be confirmed, especially the economic viability of micro- and mini-hydropower plants, solar, and wind generation. If subsidies must play a role in achieving the government’s target 20% energy from renewables in the grid by 2020, justification of subsidies and the extent of the subsidies need to be determined. Capacity building may still be needed for the adoption of new technologies, such as smart meters.

2. Lessons

113. The Power Sector Development Program was not successful in restructuring the CEB because the government created functional business units within the CEB, rather than unbundling generation, transmission, and distribution to separate companies and establishing a monitoring system for the power purchase and selling function. The program loan’s objective was not achieved because the Supreme Court of Sri Lanka found it unconstitutional and there was also political and CEB staff opposition. The lesson of this experience suggests that wholesale restructuring of institutions such as the CEB should be avoided and a piecemeal approach should be adopted in future efforts, taking into consideration legal issues that may arise at each step of the restructuring process and the concerns of people whom it may affect.
114. Investment in the transmission and distribution system was an effective approach to reduce energy losses on the system and enhance energy efficiency. The results for the project component of the Power Sector Development Program showed this, with system losses falling from 22% in 2001 to 13.9% by 2009. With additional investment in the transmission and distribution system under subsequent ADB financial assistance, system losses should fall further.

115. Extending the electrification system and providing access to electricity to 100% of households in Sri Lanka, as is expected by year-end 2016, is an effective way of raising the living standards of the poor in rural and remote areas of the country. However, the provision of physical access is often not enough and needs to be complemented by assistance with the upfront cost of connection. Credit programs for grid connections were successful because the repayment of loans was easily financed by the substantial savings on purchases of alternative energies such as kerosene.

3. Recommendations

116. The future ADB program of assistance to the energy sector in Sri Lanka should restart discussions with the government on the restructuring of the CEB with a view to decentralizing operations to improve operational and institutional efficiency and to attract private sector participation. However, restructuring should be on a piecemeal basis. Since the government has already created functional business units within the CEB, a next step could be to make these functional business units independent by transforming them into profit centers where, for example, distribution units retain the revenues they collect and allocate these to costs incurred and to the investments needed for efficient operation.

117. Investment in the transmission and distribution system should continue to improve the energy efficiency of the power system. ADB should also encourage the government to consider additional policy reforms, including an improved private sector enabling environment, for further development and expansion of renewable energy generation.