



## **Evaluate the Process of Developing New Renewable Energy Sources**





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## **1. Executive Summary**

Most of the total energy requirements of the island depend on electricity and fuel and coal thermal power plants supply 63 per cent of the total electricity generation. It is very clear the importance of turning presently to renewable energy sources to face emergency power cuts and possible foreign exchange crises in the future due to incurring a large amount of US dollar annually for this. Renewable energy generation in 2020 will account for 37 per cent of the total energy supply and New Renewable Energy (NRE) generation is about 12 per cent of the total energy supply. Sri Lanka has high wind and solar power capacity due to its geographical location and current utilization is relatively very low. Renewable energy usage can reduce greenhouse gas emission, control global warming, as well as enables to overcome the pressure on the local economy from the importation of fossil fuel. According to the current government policy, it is expected to increase the total Renewable Energy generation to 70 per cent by 2030 and it is also expected that action will not be taken to set up new coal power plants in the future.

Accordingly, the purpose of this performance audit was to evaluate the performance of the renewable energy enhancement process and the scope of the audit was limited only to evaluating the process of developing new renewable energy in the enhancement of overall renewable energy generation. Among the key observations revealed here, although it is planned to achieve the full transition (Balance in the Carbon Budget) of all power supply networks by 2050 according to the energy policy, according to the Low-Cost Long Term Generation Plan 2022-2041 presented by the CEB, the power generation from renewable sources will be only 50 per cent up to 2041 and 02 coal power plants had also been included. It can be observed that the complete transition in 2050 will not be achieved as planned by the Energy Policy through the continuous construction of long lasting coal power plants. Further, it was also observed that in accordance with the provisions of the Sustainable Energy Authority Act and the National Energy Policy, no steps had been taken to minimize the length of time consume more than 02 years required for the complex process of approving renewable energy projects by a central coordinating mechanism.

To engage to the agreements of 1,374 projects relating to 4014.84 MW approved by the Sustainable Energy Authority under the standard tariff by the C.E.B. based on the provision for the purchase of energy by bidding at minimum cost at competitive prices for extension, supply of new generation plants according to Section 43 (4) of the Sri Lanka Electricity (Amendment) Act No. 31 of 2013 had been suspended from 1 January 2017 with immediate effect. However, although the Sustainable Energy Authority had been collecting applications and fees from developers for the construction of power plants since 2017, the action had not been taken on those projects so far.

Under the competitive bidding system, only 13 solar power projects of 1 MW each had been added to the national grid from 2017 to the end of 2019. Applications are currently being invited for the development of wind power plants only for a capacity of 60 MW. It was observed that only 269 MW of capacity were connected to the main grid under the Soorya Bala Sangramaya Programme. There is also a risk of having to pay the interest due to delays in payments for electricity purchased from renewable energy suppliers. Although the United Nations Framework Convention on Climate Change has decided to replace thermal power plants with Liquefied Natural Gas power plants (LNGs) in line with the Global Charter to keep global warming below 2C<sup>0</sup>, even a single power plant had not been built so far. These conditions also contributed to the increase in emergency purchases from diesel power plants.

In the case of the above outstanding observations, a coordinating mechanism should be set up to avoid delays in obtaining approvals for energy projects and when the preparations of a long-term generation plan, it must comply with National Energy Policy and international conventions. It is also important to come to a decision regarding currently obtained Generating Licenses and Intent Letters issued projects that were not signed the purchase agreements with the CEB under the standard tariff method from 01 January 2017. It is important to retain foreign exchange and boost the local economy by engaging only local investors for small-scale projects. It may be important to pay more attention to renewable energy in the process of reviving the economy with the problem of foreign exchange reserves and accelerating the development process under the global

pandemic (Covid-19) situation that has to be faced currently. Further, it is also advisable to store solar energy and use it at peak times through the introduction of solar cells technology. Action should also be taken to minimize social protests and environmental impacts arising from the construction of sustainable energy infrastructure projects through the implementation of Corporate Social Responsibility (CSR) projects.

## **2. Introduction**

### **2.1 Corporate Background**

Renewable Energy or "Re-enable Energy Resources" means, kinetic or thermal energy sources derived from solar or geothermal activities that can be used within the territory of the Republic of Sri Lanka so as not to interfere with the ability of future generations to use it for their own benefit and these include biomass energy, hydropower energy, solar energy and wind power energy. At present, New Renewable Energy (NRE), ie Mini Hydro power plants, Solar Power, Wind Power, Biomass and Solid Waste (Agricultural Waste & Municipal Waste) such as the need to develop such low-cost eco-friendly energy sources is of great concern. The supply of reliable uninterrupted power to meet future growing demand is also in doubt due to the rapid depletion of non-renewable fossil fuels and the non-operation of coal power plants under long-term energy plans on environmental issues.

Sustainable Energy Authority of Sri Lanka (Focal National Entity for Sustainable Energy), under the energy secure Sri Lanka (Vision), to guide the nation in all its efforts to develop indigenous energy resources and conserve energy resources through exploration, facilitation, research & development and knowledge management in the journey of national development, paving the way for Sri Lanka to gain energy security by protecting natural, human and economic wealth by embracing best sustainability practices. (Mission) The Sustainable Energy Authority of Sri Lanka (Custodian of the Renewable Energy Resources) is acting to maximize the development of renewable energy sources for energy security and self-sufficiency. Appropriate power policy formulation, renewable energy development, demand management in terms of energy efficiency are include of its scope.

The new renewable energy generation will account for only 12 per cent of the total energy supply in 2020 and the contribution of large-scale hydropower plants is 25 per cent. Compliance with the United Nations Sustainable Development Goals and other global conventions, and according to the current government policy, are expected to



increase the renewable energy contribution to 70 per cent by 2030. In the situation where the generation capacity of large scale hydropower plants has been maximized, only new renewable energy sources have the potential to grow further.

As the main objectives under the Sustainable Energy Authority of Sri Lanka Act No. 35 of 2007,

- (a) Identify, evaluate and develop renewable energy resources (RE).
- (b) Improving energy efficiency and identify, promote, implement and manage energy conservation programs.
- (c) Promoting security, reliability and cost effectiveness of energy distribution.
- (d) Ensuring that the Authority has sufficient funds to carry out its objectives in line with the minimum economic cost of energy (reduction of dependence on imported energy) and energy security.

To this end, the Authority's role is to improve the approval and evaluation guidelines for NRE projects and to promote them among investors in a manner that enhances the efficiency, productivity, economy and environmental balance of the energy sector. It focuses on Supply Side Management and Demand Side Management.

The Public Utilities Commission was established under the Public Utilities Commission of Sri Lanka Act No. 35 of 2002 and in addition to the powers and functions of the said Act, the following powers and functions are vested to the PUCSL from the Sri Lanka Electricity Act No. 20 of 2009.

Acting as an economic, technical and security regulator for the electricity industry in Sri Lanka as per Section 03 of the Sri Lanka Electricity Act No. 20 of 2009 and,

- (a) Advising the government on power generation and use.
- (b) Implementing the function of regulating and inspecting licenses
- (c) Regulation of tariffs and other charges levied on the electricity industry.
- (d) An annual tax is levied on licensees under section (46).

## 2.2 The Purpose of the Audit

The purpose of this audit was to evaluate the performance of the licensing and activation process for new renewable energy power houses in the process of developing new renewable energy sources.

## 2.3 Related Institutions

A summary of the agencies involved in the process of developing new renewable energy sources and their role is given below.

<b>Institution</b> -----	<b>The Role is in Brief</b> -----
(a) Ministry of Power	Policy formulation and oversight
(b) Ceylon Electricity Board	Entering into Energy Agreements (SPPA)
(c) Public Utility Commission	Issuing power generation licenses
(d) Central Environmental Authority	Issuing certificates after considering the environmental suitability
(e) Land Commissioner General's Department	Transfer of lands for projects
(f) Department of Wildlife Conservation	Issuing fitness certificates for projects
(g) Department of Forest Conservation	Issuing fitness certificates for projects
(h) Department of Irrigation	Issuing fitness certificates for projects
(i) Coast Conservation Department	Issuing fitness certificates for projects
(j) Board of Investment of Sri Lanka	Issuing investment approval
(k) Mahaweli Authority of Sri Lanka	Issuing fitness certificates for projects

## 2.4 Criteria

The following criteria were taken into consideration.

- (a) National Energy Policy formulated by the Ministry of Power and Energy
- (b) Renewable energy provisions of the Ministry
- (c) Sustainable Energy Authority of Sri Lanka Act and detailed guidelines and targets included in the action plans

- (d) Sri Lanka Electricity Act and amendments
- (e) Public Utilities Commission Act
- (f) Goals in the Long Term Generation Expansion Plan
- (g) Recommendations from International Energy Agencies (Paris Convention)
- (h) Consents of the United Nations Framework Convention on Climate Change (UNFCCC) (COP-26)

## **2.5 Authority for Audit**

The audit under my direction in accordance with the provisions of Article 154 (1) of the Constitution of the Democratic Socialist Republic of Sri Lanka and Sections 3 (1) d, 5 (2) and 12 (h) of the National Audit Act.

## **2.6 Scope of Audit**

### **2.6.1 Compliance with International Standards**

I conducted audits in accordance with the International Auditing Standards (ISSAI 3000-3200) of the supreme audit institutions.

### **2.6.2 Scope**

The detailed audit was limited to the new renewable energy sources mentioned above due to small hydropower plants, solar and wind power have relatively high capacity among the new renewable energy sources and the number of existing projects at different stages of the development process is high in this regard. The audit activities were planned in accordance with the Audit Guidelines, the Constitution and the Audit Act.

This audit also includes the issuance of licenses by the Sustainable Energy Authority for the period 2016-2019, cancellation and implementation, inspection as per the guidelines prepared by the Authority and evaluation of the role of other related parties.

Technical and technical expert knowledge had not been used for auditing as an existing constraint in evaluating the development of new renewable energy and the audit was limited only to facts on documents and guidelines due to the lack of adequate independent technical research information.

## **2.7 Audit Methodology**

The evidence relevant to this audit test was gathered from the following audit approaches based on the Results Oriented Approach.

- (a) Study of Acts related to the process of developing new renewable energy sources, national policies ,long term plans, gazette notifications and other documents.
- (b) Obtaining and analyzing data and information from organizations directly involved in the process of developing new renewable energy sources.
- (c) Review of other relevant documents pertaining to the inquiries made by new renewable energy manufacturers.
- (d) Examination of the agreements entered into with international organizations.
- (e) Study and examination of media reports.
- (f) Cost Benefit Analysis.
- (g) Examination of Feasibility Study Reports and project agreements.

### **3. Detailed Audit Findings**

#### **3.1 Institutional Background and Preparation for This Task**

##### **3.1.1 National Energy Policy and Strategies of Sri Lanka**

**3.1.1.1** Sri Lanka's National Energy Policy and Strategies (Gazette No. 2135 / 61 - 09.08.2019) were formulated in line with Sri Lanka's Future Goals, Current Global Energy Trends and the United Nations Seventh Sustainable Development Goals. It is planned to reach the full transit of all power supply networks by 2050. Although energy policy needs to be reviewed to adapt to significant changes in the external environment, the review of the 2008 National Policy was carried out in 2019 by 11 years later. Although accordingly the timeliness of the National Policy on Energy is important for the implementation of power generation projects for the power supply of Sri Lanka, an environment had been created until 2019 for the implementation of relevant project proposals without complying with the national policy.

**3.1.1.2** The basic objective of the Government's Power Development Policy is to ensure easy-to-use, affordable, clean, secure, reliable and economically viable power supply that is conducive to social development. This policy should help overcome the challenges posed by climate change, to add more and more of these renewable energy sources to the energy stream, which has been made possible by new technology providing an opportunity for a new renewable energy policy and its emerging role. However, although it is emphasized on the implementation of power plants as planned in the Least Cost Long Term Generation Expansion Plan (LCLTGEP) identified under the provision of energy services in the National Electricity Policy, it was not in line with the proposed Long Term Generation Plan 2022-2041 prepared by the CEB and the targets of the National Electricity Policy. According to the Cabinet Memorandum CP/21/16/1628/318/046 dated 20.08.2021, the following key policy targets were approved by the Cabinet at its meeting held on 13.09.2021.

- Obtaining 70 per cent of power generation from renewable sources by 2030.
- No capacity addition for coal power plants.
- Achieving Carbon Neutrality in Energy Generation by 2050

Further, it had also instructed the Secretary to the Ministry of Power and Energy to direct the Chairman of the Ceylon Electricity Board to take immediate steps to prepare a Least Cost Long Term Generation Plan 2022-2041 based on the general policy guidelines applicable to the power industry by the Cabinet decision. However, the Ceylon Electricity Board had submitted a draft of the Least Cost Long Term Generation Plan 2022-2041 to the PUCSL in July 2021 and it had been rejected because it was not in line with the current policy. According to the letter of the PUCSL dated 05 October 2021, the General Manager of the Ceylon Electricity Board had been informed to revise the new Long Term Generation Plan 2022-2041 in line with the new policy of the Government and submit it on or before 30 June 2022.

However, the Ceylon Electricity Board had unveiled the Least Cost Long Term Generation Plan 2022-2041 which did not comply with the government's new policy in October 2021. According to it, it will generate 50 per cent of electricity from renewable sources until 2041 and two coal power plants also had been included. The new targets had been announced also by the President of Sri Lanka at the United Nations Energy Conference on 22 September 2021. Although it should be noted that the currently operating Lakvijaya Coal Power Plant alone emits about 5,000 tons of carbon dioxide (CO<sub>2</sub>) per year, it had not been done accordingly.

**3.1.1.3** Although the National Policy states that it will reduce the length of time required for the approval of renewable energy projects to more than 2 years through a central coordination mechanism, the necessary steps had not been taken so far. As a result, entrepreneurs are wasting their valuable time, money and labor unnecessarily and are discouraged and have to abandon projects and it missed opportunities to add new energy sources to the national grid.

**3.1.1.4** Although the policy states that the Ministry of Power and Energy will appoint a committee consisting of officials from government agencies and Line Ministries to coordinate the approval of renewable energy projects and land acquisition by the end of 2019, the committee had not been appointed until now. Failure to do so would have hampered the smooth running of the process and the implementation of the goals and

objectives set out in the National Policy within the stipulated time frame and this was an obstacle to achieving the desired performance.

### **3.1.2 Legal Background**

The Sustainable Energy Authority of Sri Lanka Act No. 35 of 2007 empowers the Sustainable Energy Authority of Sri Lanka to identify, evaluate and develop renewable energy resources (REs) and improving energy efficiency in terms of minimum economic cost of energy. (Reduction of dependence on imported energy) Further, the Sri Lanka Electricity Act No. 20 of 2009, the Sri Lanka Electricity Amendment Act No. 31 of 2013 and the Public Utilities Commission Act No. 35 of 2002 are mainly applicable.

According to Section 43 of the Sri Lanka Electricity Act No. 20 of 2009, it cannot be purchased from Sustainable Energy Authority licensees as before due to all purchases must be made through competitive bidding. The Sustainable Energy Authority continued to issue licenses under its Act despite this legal situation. However, according to the Ceylon Electricity (Amendment) Act No. 31 of 2013, the CEB had suspended the signing of agreements with the licensees of the Sustainable Energy Authority with immediate effect from 01 January 2017. Accordingly, in terms of Section 43 (4) of the Ceylon Electricity (Amendment) Act No. 31 of 2013, agreements were suspended under the previous standard tariff based on the rule to purchase energy through bids at the lowest cost under competitive prices for extension, supply of new generation plants.

According to the Sustainable Energy Authority Act No. 35 of 2007, these purchase agreements (SPPAs) were done according to the standard tariff approved by the Cabinet of Ministers to encourage private sector investors. Although it was important to address this problem quickly in the development of renewable energy, it is observed that action had not been taken accordingly.

### 3.2 New Renewable Energy (NRE) Source Development Process

#### 3.2.1 Short-term Goals to be attained on Behalf of Goals by 2030 and 2050

According to the United Nations Sustainable Development Agenda and current government policy, renewable energy sources are expected to grow to 70 per cent by 2030 and to a complete transition of renewable energy by 2050 in line with the National Energy Policy. Also, the relevant long-term plans should be reviewed every 02 years. Accordingly, although it was observed that the relevant projects are being implemented without identifying the short-term goals that need to be achieved in moving towards the relevant long-term goals, it was not possible to consider the progress of the implementation of the relevant projects in the short term due to this.

#### 3.2.2 Issuing licenses for Projects

According to the Sustainable Energy Authority of Sri Lanka Act No. 35 of 2007 and detailed guidelines, the process of developing NRE projects had been delayed due to the weaknesses described in the next paragraphs of the NRE project approval methods adopted before and after 2017 and the relevant details are given below.

The contribution of the Sustainable Energy Authority to new renewable energy sources is only 11 per cent of the total generation capacity as at 31 December 2019. (Source: Renewable Energy Division, S.E.A.)

The details are as follows.

<u>Source</u>	<u>No. of Projects</u>	<u>Capacity (Mw)</u>
Mini Hydro Power Plants	206	417.26
Wind Power Plants	15	128.15
Biomass Power Plants	12	43.53
Solar Power Plant – Except Domestic Roof Top Power Plants (Tender 1MW*6)	<u>14</u>	<u>57.36</u>
<b>Total</b>	<b><u>247</u></b>	<b><u>646.30</u></b>



**3.2.2.1** The guidelines introduced for the development of new renewable energy projects involve a very complex process. It should be a simpler and more effective method. This has become a laborious and time consuming process as investors are unable to obtain the necessary approvals and licenses. Developers must obtain approval from 10 relevant line agencies to obtain a Generation License. At the time of issuing the energy license, the project developer has to renew the approvals obtained from the Central Environmental Authority, the Forest Department and the Wildlife Department due to expiration. Therefore, it is observed that a developer has to spend 2 to 5 years to obtain a generation license.

**3.2.2.2** According to the Renewable Energy Project Order No. 01 of PE/TECH/D/06/01 dated 04 March 2016 issued by the Minister of Power and Renewable Energy, although the Authorities had been informed that steps should be taken to implement a simpler methodology in the future, there is still a delay in the implementation of the relevant projects due to the lack of simplification of the process.

### **3.3 Implementation of projects under the Sustainable Energy Authority**

#### **3.3.1 Implementation of New Renewable Energy Projects**

Although the energy license was issued, the audit observed that the construction work of 58 projects had been halted due to the following various reasons. These 58 projects had failed to add 129.75 megawatts of power to the national grid, ranging in capacity from 0.03 megawatts to 10 megawatts. (Annexure 1)

The relevant projects are summarized below.

- (a) At the time of issuing the energy license, the project developer has to extend the approvals obtained from the Central Environmental Authority, the Forest Department and the Wildlife Department due to expiration and there were 13 projects with a capacity of 23 MW that were not commenced construction work due to the refusal of the relevant agencies to extend the approvals and the delay in granting approvals.

- (b) There were 12 projects with a capacity of 13 MW due to delays in land acquisition.
- (c) There were 25 projects with a capacity of 80 MW due to the non-signing of power purchase agreements by the Ceylon Electricity Board.
- (d) It was observed that the construction was halted in 8 projects with a capacity of 14 MW due to various other reasons.

Even after reaching the final stage of this complex process, entrepreneurs have to face such situations again and again, which has disrupted their efforts to achieve the relevant goals. Thus, delays in these projects could have been avoided with the full involvement of management, but had not been done so.

### **3.3.2 Approved projects but not Signed Agreements**

The operation of 1,374 projects with 4,014.85 MW submitted for network agreement and licenses, temporary approval was granted by the Sustainable Energy Authority from 01 January 2017 to 31 December 2019 approved by the Project Approval Committee (PAC) under the role of the Sustainable Energy Authority had stopped due to CEB had rejected the signing of the agreements\* due to entering into competitive bidding.

There were also 30 projects that were suspended after coming into their final stage ie: the signing of the agreement. Further, there were also 130 projects that had received temporary approval. The main reason for this situation was the suspension of the existing system at once, which had been in place since the beginning of 2017. The relevant legal background for this is described in paragraph 3.1.2 and the details of the suspended projects are as follows.

Description -----	No. of projects -----	Capacity (MW) -----
No agreements signed	30	49.33
Temporary approval received (letter of intent not issued)	53	127.61
Temporary approval received (letter of intent not extended)	77	110.67
Referred to Network Agreement	1214	3727.23
	-----	-----
<b>Total</b>	<b>1374</b>	<b>4014.84</b>
	=====	=====

*\* "Electricity Purchase Agreement" is an agreement entered into by a transmission licensee with a power generation licensee to purchase electricity in bulk or in bulk capacity only for the purpose of selling electricity to distribution licensees. "*

### **3.3.3 Promptly Consideration of Applications Received**

Since 2017, the Sustainable Energy Authority had received applications from developers with money for the continuous construction of 144 power plants, including solar and small hydropower plants, and submitted them to the CEB and so far no progress has been made on those projects. The details are as follows. Accordingly, as per the applications submitted for 144 projects under 7 sources, the capacity was 699.96 MW and the fee to be charged for applying for those projects was Rs. 42,233,000 had been obtained by the Authority. Accordingly, as mentioned above, the approval of further applications continued to be delayed. The main reason for these delays was observed to be a weakness in the coordination process between the two agencies. The details were as follows.

<b>Source</b>	<b>No. of Projects</b>	<b>Capacity (MW)</b>	<b>Application Fee Approximate (Rs.)</b>
-----	-----	-----	-----
Biomass	11	64.10	3,755,000
Solid Waste	18	106.30	6,215,000
Hydropower	33	61.76	4,738,000
Solar Power	71	384.00	22,750,000
Wind	9	81.50	4,525,000
Thermal	1	2.00	150,000
Others	1	0.30	100,000
	----	-----	-----
	<b>144</b>	<b>699.96</b>	<b>42,233,000</b>
	====	=====	=====

### **3.4 Least Cost Long Term Generation Expansion Plan**

#### **3.4.1 Preparation of plan**

This will be prepared by the CEB Generation Planning Division for a period of two decades and should be forwarded to the Public Utilities Commission for approval. This was reviewed again by every 02 years.

#### **3.4.2 Renewable Energy Targets According to the Long Term Generation Expansion Plan (LTGEP)**

The details are shown in the table below.

<b>Source</b>	<b>LTGEP 2015- 2034 (MW)</b>	<b>LTGEP 2018- 2037 (MW)</b>	<b>Difference</b>	<b>Performance 2019 (MW)</b>
Mini Hydropower Plants	388	359	(29)	417
Winds	254	194	(60)	128
Biomass	99	44	(55)	44
Solar Power Plants including Roof Top Solar Panel	61	305	244	318

The relevant observations are as follows.

- (a) According to the above information, the targets planned to be achieved by wind and biomass power plants at the end of 2019 from LTGEP 2015-2034 published by the CEB had been drop-down by LTGEP 2018-2037 range from 29 MW to 60 MW and targets to be achieved by 2019 for wind power and biomass power generation had not been achieved by other projects other than small hydro power plants.
- (b) The LTGEP 2018-2037 seems to have been approved by including more convenient targets due to failure to achieve the targeted performance of LTGEP 2015-2034 by CEB. It also appears that the goals and performance of small hydropower plants are not logical and motivational.

- (c) According to the LTGEP 2018-2037, although it was planned to reach 18.4 per cent new renewable energy supply by the end of 2020 as per the published information for the year 2020, the actual contribution achieved was only 12 per cent. That is, the contribution of small hydropower plants among new renewable energy is 7 per cent. The contribution of solar and wind energy is only 5 per cent of the total energy supply. In the situation where the generation capacity of large scale hydropower plants has been maximized, only new renewable energy sources have the potential to grow further.
- (d) Suspension of signing renewable energy purchase agreements on a standard tariff basis from 2017 by the CEB has also affected the failure to achieve the expected renewable energy generation targets. So far no bidding has been made for small hydro power plants and therefore, suppliers who intend to build small scale hydropower plants did not enter the industry and the Ceylon Electricity Board has also lost the ability to purchase electricity at a lower price. As a result, the purchase of high cost electricity from private diesel power plants and the outflow of foreign exchange had gradually increased in recent years. Accordingly, it was observed that the percentage of total emergency purchases in 2020 will increase by 14 per cent compared to 2017. Details are given in Schedule 02.

### **3.4.3 Competitive Bidding for Renewable Energy Development Projects**

**3.4.3.1** The Renewable Energy Supply Industry in Sri Lanka operated on a standard tariff basis until the beginning of 2017 and the standard pricing system was implemented to attract local investors because it is an innovative industry as well as required high investment. Mainly the small scale hydro power plant sector was able to achieve a high level of performance under this. However, from the beginning of 2017, the Ceylon Electricity Board decided to award contracts based on the competitive bidding system. At that time, only projects that had signed the Standard Power Purchase Agreement (SPPA) were implemented. At that time, 144 new investors who were interested in investing in new renewable energy sectors such as small hydro power plants, solar power plants and wind power plants were registered with the Sustainable Energy Authority of Sri Lanka and were on the waiting list and 1,374 investors were fulfilling the compliance at various stages of the power plant construction process.

**3.4.3.2** Accordingly, the CEB had called competitive bids for only six solar and wind power projects (191 MW) since January 2017 up to 2019 when the standard tariff system was discontinued and the current status of those projects are as follows.

<b>Project</b>	<b>No. of Power Plants</b>	<b>Total Capacity (MW)</b>	<b>Project progress</b>
Wind Power Plants 2x10 MW	2	20	Added to the national grid in the month of June 2020.
Solar Power Plants 60x1 MW	35	35	Pending commissioning -22 Commissioned – 13
Solar Power Plants 90x1 MW	71	71	Agreement Signed-17. Out of it construction is scheduled to start -10, Agreements to be signed - 53 For Cabinet Approval -1
Solar Power Plants 2x10 MW	2	20	Yet to be land clearance, Pending PPA
Wind Power Plants (1 MW-10 MW)	4	35	Evaluation of bids is ongoing.
Solar Power Plants (With cultivation)	1	10	Agreements are to be signed.
<b>Total</b>	<b>114</b>	<b>191 MW</b>	

The relevant observations were as follows.

- (a) The contracts had been awarded only for 114 power projects with 01 megawatts. (146 megawatts) and out of these, only six projects with 1 megawatt each were granted in 2017 had been added to the national grid until the end of December 2019. Only 2 wind power plants are under construction and applications were called for the addition of 60 megawatts of capacity to the national grid. Two 20 MW solar power projects among the projects awarded had been halted due to land acquisition difficulties.

- (b) It was observed that achieving the desired targets in the field of solar and wind renewable energy development is challenging according to the 2022-2041 LTEGP currently in operation.

The relevant information was as follows.

<b>Renewable Energy Source</b>	<b>Actual Performance as at 31.12.2020 MW</b>	<b>Targeted Performance 2022 MW</b>	<b>Targeted Performance 2030 MW</b>
Mini Hydropower Plants	410	464	554
Wind Power Plants	179	268	1,013
Biomass Power Plants	50	81	120
Solar Power Plants	425	1,039	2,684

Accordingly, It was observed that it will take about two years from the awarding of the contract for a renewable energy power plant to connect to the national grid, the expected target for the development of wind power plants by the year 2022 is 268 MW and 179 megawatts will be supplied to the national grid by the end of 2020. Although it should be reached 268 megawatt target by the end of 2022, applications were currently invited for a capacity of only 60 MW.

- (c) The 425 MW solar power projects had been developed in Sri Lanka by the end of 2020 and the targeted development for 2022 and 2030 is 1,039 MW and 2,684 MW respectively. It was observed that achieving the renewable energy development goals was doubtful because at the beginning of 2020, there were only 46 energy licensed projects (91 MW), 33 tentatively approved projects (69 MW) and only one project (10 MW) that has not yet been awarded a contract.



### **3.4.4 The Payment as Scheduled for Electricity Purchased from Existing NRE Projects**

The relevant details were as follows.

**3.4.4.1** According to the standard electricity purchase agreement, although payments should be made within 30 days from the date of meter readings at the power houses, payment for the invoices submitted in July 2021 had not been completed even as at December 2021. Accordingly, payments to be made by the Ceylon Electricity Board for electricity purchased from renewable energy suppliers would be delayed by about 06 months by the end of 2021 were observed. The risk of having to pay a Prime Rate for late payments was observed because the standard electricity purchase agreement states that an interest amount has to be paid to the suppliers for the payments made after the due date.

**3.4.4.2** The investors are facing difficulties in repaying loan installments due to late payments and there is also a risk of rising interest rates on loans from financial institutions to investors. At the same time, financial risk can discourage new investments and push up demand prices.

## **3.5 General Matters**

### **3.5.1 Current Challenges Regarding Power Generation**

According to the National Policy on Energy of Sri Lanka, which was reviewed in 2019 and the main targets of the Key Policy on Energy approved by the Cabinet of Ministers on 13-09-2021, it had identified the methodology to fulfilling the energy needs in Sri Lanka. Accordingly, although the low-cost energy long term generation plans are required to be formulated, in view of the fact that the plan had been formulated in a manner inconsistent with the new policy of the Government, the importance of focusing on renewable energy while continuing to supply electricity demand is seen to be very important today due to the reasons such as the recovery of the economy in the face of the COVID-19 pandemic and the problem of foreign exchange reserves faced by the Sri Lankan economy is an obstacle to importing fuel for power generation and the difficulty in obtaining fuel requirements during the current financial situation of the Ceylon Electricity Board.

### **3.5.2 Battle for Solar Power**

In collaboration with the Ministry of Power and Renewable Energy and the Sustainable Energy Authority, a community power generation programme called 'Surya Bala Sangramaya' was launched on 04 August 2016 with the approval of the Cabinet of Ministers to generate renewable electricity for the country's electricity consumers. This program was launched on 6 September 2016 to connect the electricity generated by the solar panels installed on the rooftops of the houses of electricity consumers to the national grid and maintained throughout the year 2017. It works in three modes namely net metering, net accounting and net power producers. Although it was aimed to generate 1,000 MW capacities by 1,000,000 rooftops by 2025, only 24,696 customers had connected 269 MW to the national grid as at 2020 were observed. It was observed that the failure to identify the targets to be achieved annually had also been a barrier in achieving those targets.

### **3.5.3 Environmental Suitability**

The Paris Convention was adopted in November 2015 at the 21 sessions of the United Nations Framework Convention on Climate Change in the city of Paris in France. Owing to developing countries such as Sri Lanka have to face the adverse effects of climate change because of the high emissions of greenhouse gases released by developed industrialized countries in the past and present, according to the United Nations Framework Convention on Climate Change (UNFCCC), developed countries need to provide the financial, technological and capacity development needed for actions to mitigate the impact of climate change in developing countries. Accordingly, it was expected to contribute to the global charter of keeping global warming below 2 C<sup>0</sup> was decided locally by Sri Lanka as a member country.

The following observations are made in this connection.

**3.5.3.1** Sri Lanka signed the agreement on 22 April 2016 at the United Nations Headquarters and it was intended to minimize greenhouse gases such as Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Nitrous Oxide (NO<sub>2</sub>) emitted by power generation, transportation industries, waste and forest resources.

Sri Lanka is acting as currently by 2030, reducing greenhouse gas emissions in the energy sector by 20 per cent as unconditionally by 4 per cent of national capacity and by 16 per cent on conditional cooperation of external parties. Accordingly, although it could be to fulfill the agreements reached only through fully transitional to clean energies, it was observed that such a situation would not be easy to achieve in the future in the present circumstances.

**3.5.3.2** Although it was decided to introduce Liquefied Natural Gas (LNG) power plants instead of thermal power plants to reduce carbon emissions in the power sector by Nationally Determined Contributions (NDCs<sup>7</sup>), no power plant had been commissioned so far.

### 3.6 Achieving the Sustainable Development Goals on Energy

Sri Lanka is committed to implementing the United Nations Theory of Sustainable Development in the period of 2015-2030. Sri Lanka had passed the Sri Lanka Sustainable Development Act No. 19 of 2017 in this regard in the Parliament. Sri Lanka is the 39 place among the greenest countries in the world and it should be implemented together with private and public to achieve sustainable development goals in 2030. Following are the observations on achieving the relevant goals.

#### 3.6.1 Total Power Generation and Renewable Energy Generation

For the Sustainable Development Goals of the Ministry of Power and Energy, it had been decided that the renewable energy generation should be 70 per cent of the total power generation by 2030 and renewable energy generation was only 37 per cent of total power generation by the end of 2020.

Accordingly, it was observed the renewable energy generation of the last 06 years ranged from a minimum contribution of 49 per cent to 31 per cent from 2015 to 2020 respectively compared to the total power generation, while the new renewable energy generation was also 8 per cent to 12 per cent.

The details are as follows.

<b>Year</b>	<b>Total Generation Capacity (GW)</b>	<b>Renewable Energy Capacity (GW)</b>	<b>Renewable Energy Capacity (%)</b>	<b>New Renewable Energy Capacity (GW)</b>	<b>New Renewable Energy Capacity (%)</b>
2015	13,090	6,371	49	1,467	11
2016	14,148	4,641	33	1,160	8
2017	14,671	4,523	31	1,464	10
2018	15,257	6,864	45	1,715	11
2019	15,937	5,545	35	1,761	11
2020	15,719	3,911	25	1,866	12

## **3.6.2 Sustainable Development Goals**

**3.6.2.1** According to Sustainable Development Objective 7.1, although it needs to ensure that everyone has access to affordable, reliable and modern energy sources by 2030, the proportion of the population with access to electricity had increased from 99.3 per cent in 2016 to 99.9 per cent in 2020. But renewable energy generation is 37 per cent of the total power supply. Out of this, new renewable energy generation was 12 per cent. These 895 MW of new renewable energy generation is only able to achieve 2124.7 million kilograms of carbon depletion annually.

**3.6.2.2** According to Sustainable Development Objective 7.3, although 600 GW hours should be conserved by 2025 to double the global rate of energy efficiency enhancement by 2030, the Presidential Task Force on Energy Demand Side Management (ODSM) had done only provided 10 million light-emitting diodes at a discounted price to domestic consumers in 2019.

#### **4. Recommendations**

- 4.1** Under enhancing the contribution of renewable energy in the National Power Policy, taking steps for the development of the applications submitted to the Sustainable Energy Authority during the period when the standard pricing system was active but did not make any progress as the system was discontinued and are currently at various stages of the approval process by moving towards a competitive methodology through an appropriate interim program.
- 4.2** As 1,374 projects which are currently licensed for Generate and had issued letters of intent to be signed electricity purchase agreements under the standard tariff with the CEB from 01 January 2017 had been delayed up to 03 years, it is advisable to prepare suitable works expeditiously to start the development activities.
- 4.3** According to the current state policy, it is also expected to increase total renewable energy generation up to 70 per cent by 2030 and high active participation of local and foreign private sectors is also expected. The solar and wind power capacity should be increased to 8,000 MW for this. But the reasons for the failure of solar power to reach effective levels can be attributed to the high cost and lack of profitable financing methods. Loan and incentive schemes should be introduced for that. The required energy should be provided through development project to generate solar power together with private and public sector.
- 4.4** In terms of Section 21 of the Sri Lanka Sustainable Energy Authority Act No. 35 of 2007, in case of failure to start the project and generate electricity within 02 years or in case of violation of terms and conditions, the Director General will take appropriate action expeditiously in consultation with other concerned institutions with the approval of the Board of Directors of the Authority.
- 4.5** As the commencement of many projects has been delayed due to delays in obtaining approvals from various institutions for renewable energy projects, establishment of a mechanism to prevent such delays in coordination with the relevant agencies.

- 4.6** The CEB prepares a long term generation plan for 20 years and updates it every two years. Through it, remedial actions should be taken to prevent a power cut in the events of drought, inactivation of powerhouses and also increase in demand relatively. Further, policy and targeted plans need to be really coordinated so that there is no room for emergency purchases outside of this minimum cost plan.
- 4.7** Existing problems with power transmission systems and transmission lines have led to delays in initiating large-scale renewable energy projects as well as increasing small-scale projects, so it is important to prioritize relevant infrastructure development activities.
- 4.8** Introducing solar cell technology to store solar energy and use it to use electricity during peak hours.
- 4.9** Entrepreneurs should be encouraged through the introduction of tax relief and concessionary tariff rates. Although the Third Schedule to the Inland Revenue (Amendment) Act No.10 of 2021 was amended to provide a tax concession for a period of 07 years to any renewable energy project established with the potential to generate not less than 100 MW of solar or wind power and supply that energy to the National Grid, such concessions are not being eligible for small scale projects as well as not being applicable for small scale hydropower projects and biomass projects, it is necessary to take appropriate action because many small-scale renewable energy entrepreneurs are discouraged.
- 4.10** Policy decisions need to be made on legal issues, technological changes and network capacity in the procurement process.
- 4.11** Initiating large scale renewable energy projects at the state level for generating electricity at low cost and action should be taken to avoid the payment of high costs (Capacity charges, Delay charges) for IPP.

**4.12** Taking action to minimize social protests and environmental impacts arising from the construction of energy infrastructure projects by Implementing Corporate Social Responsibility (CSR) projects.

**Sgd./W.P.C. Wickramaratne  
Auditor General**

W.P.C. Wickramarathne  
Auditor General

08 February 2022



**Annexture : 01**

<b>Number</b>	<b>Name of the Project</b>	<b>Source</b>	<b>Capacity</b>	<b>Reasons for Delay</b>
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1	1830 Mount Vernon	MHP	1	Rejected by the Central Environmental Authority (Waterfall)
2	22900 Upper Aberdeen	MHP	0.6	Delay in extending the approval of the Central Environmental Authority.
3	27580 Upper Kadurugaldola	MHP	2	A court case is pending against the Central Environmental Authority.
4	23190 Kithulgala	MHP	7.3	Failure to extend the approval of the Central Environmental Authority.
5	25000 Norwood	MHP	1	Delay in land acquisition - 2019/01/04
6	1260 Ingiriya	MHP	0.8	Delay in land acquisition – Ownership-Nadun Rajamaha Viharaya
7	1450 Maraliya Oya	MHP	0.5	Delay in land acquisition – Ownership-Nadun Rajamaha Viharaya
8	23980 Siri Oya	MHP	1	Delay in land acquisition - Construction has commenced now.
9	3240 Upper Neluwa	MHP	2	Delay in land acquisition – Crown Lands
10	22920 St Heliers	MHP	0.75	The process of land acquisition is underway.
11	23160 Dilaswala	MHP	1.6	The process of land acquisition is underway.
	Athuru Oya	MHP		
	Siyambalabokka			
12	23200 (Rattota Oya)	MHP	2	Delay in land acquisition
13	23810 Minumkumbura	MHP	0.7	Delay in land acquisition - Construction has now commenced.
14	23900 Lower Lemastota	MHP	1	Delay in land acquisition
15	26730 Bathmedilla	MHP	1	Delay in land acquisition
16	26930 Dewuldola 1	MHP	0.2	Delay in land acquisition
17	3910 Makeliya Dala	MHP	0.45	Delay in the extension of the Forest

18	22910	Illukpelessa	MHP	1.5	Conservation Department's approval. Delay in the extension of the Forest Conservation Department's approval.
19	23010	Haignran Oya - 11	MHP	0.65	Delay in the extension of the Forest Conservation Department's approval.
20	23940	Populaketiya	MHP	1.4	Delay in the extension of the Forest Conservation Department's approval.
21	24390	Kunburugolla	MHP	1.5	Delay in the extension of the Forest Conservation Department's approval.
22	28200	Anda Dola	MHP	0.77	Delay in the extension of the Forest Conservation Department's approval.
23	23830	Ma Oya – Uda Dumbara	MHP	4	Delay in the extension of the Forest Conservation Department's approval.
24	1610	Illukpelessa - 1	MHP	2	Suspension of construction by the Irrigation Department..
25	26600	Deduru Oya	MHP	2	Project of the Irrigation Department - Construction has now commenced.
26	1740	Siybalagastenna	MHP	0.95	Delay in obtaining Grid Estimate - Request for renewal of CEA approval.
27	23510	Dedugala	MHP	1	Delay in obtaining Grid Estimate - Request for renewal of CEA approval
28	23990	Upper Rathganga – 11	MHP	1	Delay in extension of approval of the Department of Wildlife Conservation.
29	26630	Rannakanda	MHP	1.75	Delay in extension of approval of the Department of Wildlife Conservation
30	6240	Hathmala Ella	MHP	2	Delay in approval of the DCC - The process of land acquisition is now underway.

31	23080	Kegalu Oya		0.95	Delay in approval of the DCC – Revised proposal was submitted. Changes in project plans due to social issues and MASL approval has not yet been obtained.
32	6880	Kiula	MHP	2.8	Delays were made due to cases were filed by NGOs and they were dismissed.
33	1940	Morapitiya	MHP	1.5	Need to extend the permission of Conservator of Forest
34	27400	Bogahahena – Kukula	MHP	2.3	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
35	23070	Gemunupura	MHP	1.3	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
36	23330	Alupotha	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board.
37	23580	Ehelagahawadiya	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
38	23600	Wilgama	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board.
39	23640	AgCo Blackpool	MHP	0.5	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
40	23920	Palagolla	MHP	0.4	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
41	23980	Siri Oya	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board

42	24410	Maliboda	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
43	24730	Parambe	MHP	1.25	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
44	24880	Blackwater 11	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
45	25000	Norwood	MHP	1	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
46	26880	Waharakawatta	MHP	0.8	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board.
47	26890	Magala Ganga 11	MHP	2.4	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
48	26890	Kiriwela	MHP	2.2	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
49	33250	Amunumulla Micro	MHP	0.03	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
50	25770	Veemankamam	BMP - Dendro	5.5	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board.
51	27060	Maramba	BMP - Dendro	3	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
52	23560	Kaduwela	BMP - SWP	10	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board

53	29980	Trilogy Waste	Waste Municipal	3.4	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
54	36590	Gonnoruwa IV	Battery Storage	10	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
	28690	Solar Storage (Alutnuwara)	Solar Storage	10	
55			Solar Pv with		
56	37590	Gonnoruwa IV	Battery Storage	10	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
57	27040	Sol Navitas (Pvt) Ltd	Solar Thermal	10	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
58	27050	Elecsis Power (Pvt) Ltd	Solar Thermal	10	Failure to sign the Energy Purchase Agreement by the Ceylon Electricity Board
		<b>Total</b>		<b>129.75</b>	
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## Annexure 02

2017		2018		2019		2020	
Unit(KWh)	Expenditure Rs.M	Unit(KWh)	Expenditure Rs.M	Unit(KWh)	Expenditure Rs.M	Unit(KWh)	Expenditure Rs.M
695,405,402	19,405	387,321,376	11,581	448,004,994	12,675	811,000,000	22,200