SUMMARY ASSESSMENT OF DAMAGE AND NEEDS: ENERGY SECTOR

A. Energy sector overview

1. Tonga comprises five island groups—Tongatapu, ‘Eua, Ha’apai, Vava’u, and Niuas—with a total of 176 islands. Although 89% of Tonga’s households enjoy access to grid electricity, about 90% of power generation relies on imported diesel, making Tonga highly vulnerable to oil price changes and shocks. Tonga’s remote location and high transportation costs for the imported diesel further contribute to high electricity tariffs. This in turn affects the affordability of food, goods, electricity, and transport. The Government of Tonga has set a target of reducing fossil fuel imports for power generation by 50% by 2020, and defines a strategy for achieving this goal in the Tonga Energy Roadmap 2010–2020.

2. Tonga Power Limited (TPL) is a government-owned, vertically integrated public enterprise, and it is solely responsible for providing grid-connected electricity services in Tonga, under the oversight of the Ministry of Public Enterprises and the government cabinet. It has concessions to operate four independent grids—the largest, which is on the main island of Tongatapu, and three smaller grids on the main islands of the ‘Eua, Ha’apai, and Vava’u island groups. TPL generates, distributes, and retails electricity, and provides operation and maintenance services. The Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications is the primary institutional body responsible for policy formulation, as well as for implementation of rural electrification and demand management projects for off-grid electricity services.

3. The Nuku’alofa energy distribution network was developed in the 1950s. Initially, households were provided with one light and one power point as a part of the electrification project. The network has expanded considerably since then, and in accordance with growth has required continual maintenance and upgrades. While power poles and lines were upgraded at different times over the intervening years, the entire system is now in need of an upgrade to ensure greater safety and resilience.

B. Damage overview[1]

4. Tropical Cyclone Gita passed over the Tongatapu and ‘Eua island groups starting around 11 pm on Monday, 12 February 2018. After the cyclone’s passage from Tonga, reports of significant damage on both Tongatapu and ‘Eua emerged. The storm affected about 80,000 people, or 80% of Tonga’s population. It brought down power lines; damaged and destroyed schools, resulting in closures; destroyed crops and fruit trees; and damaged public buildings, including the domestic airport, the Parliament building, and Tonga meteorological services. Cyclone Gita also destroyed more than 800 houses and damaged a further 4,000.

5. The total economic value of the effects caused by Cyclone Gita was estimated to be about $164.3 million. This is equivalent to 37.9% of the nominal gross domestic product of Tonga,[2] and suggests the scale of the impact. Of these effects, $96.3 million is attributable to damage and $68.0 million is attributable to losses.

[1] This summary is based on Kingdom of Tonga. 2018. *Post-Disaster Rapid Assessment, Tropical Cyclone Gita.* Nuku’alofa. Available on request.

[2] The share is calculated for the nominal 2017 GDP, which is estimated at T$941.9 million.

6. Housing sustained the highest level of damage, accounting for 60% of the total damage cost, followed by the tourism sector (14%). The largest level of economic losses is expected in the agriculture sector, estimated at 80% of total losses. The effects of production losses and associated higher costs of production will linger for some time. The negative impact of the disaster on overall economic conditions in the country will thus be felt for several years to come.

7. Cyclone Gita disrupted power supply on the islands of ‘Eua and Tongatapu, disconnecting all TPL customers in the area. On Tongatapu, the damage was and continues to be more significant than on ‘Eua. All customers on ‘Eua (about 1,170) were reconnected to power supply 14 days after the cyclone’s landfall. The 17,782 customers on Tongatapu were reconnected to power supply over a 6-week period, during which businesses and schools were closed.

8. The service lines that had already been upgraded under the ongoing Outer Islands Renewable Energy Project (OIREP)[3] in ‘Eua, and under the Tonga Village Network Upgrade Project (TVNUP)[4] in Tongatapu funded by the New Zealand Ministry of Foreign Affairs and Trade (MFAT), experienced significantly less damage than the grids that had not yet been upgraded. On Tongatapu, TVNUP had already upgraded 54% of TPL’s grid prior to the landfall of the cyclone. Of the grids that had not yet been upgraded, 45.9% were damaged, compared with a damage of only 4.7% to the upgraded grids. The experience from OIREP and the TVNUP clearly demonstrates the resilience benefits of updating inefficient and aging power network infrastructure and building back better.

9. The total effects of the cyclone are estimated at $7.9 million, consisting of $6.2 million in damage to power sector infrastructure and $1.7 million in losses to TPL, mainly from loss of revenue. About 95% of the total damage to TPL’s power network assets was on Tongatapu.

C. Government’s recovery priorities

10. The Government of Tonga has reiterated the importance of the concept of “building back better”[5] to avoid similar disaster damage in the future. The table below provides a summary of the estimated costs for recovery and reconstruction. Total recovery and reconstruction is estimated at $148.7 million. Of this, $33.7 million is required for immediate recovery (to 30 June 2018), $43.0 million for short-term recovery (fiscal year 2019)[6], and $73.0 million for medium-term recovery (fiscal years 2020–2021).

[3] ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Grant to the Kingdom of Tonga for the Outer Island Renewable Energy Project.* Manila.

[4] TPL’s grid on Tongatapu includes most of the 10 villages on the island’s western side. The Tonga Village Network Upgrade Project is funded by the Government of New Zealand through its Ministry of Foreign Affairs and Trade.

[5] ‘‘Building back better” is an approach to reconstruction that seeks to reduce vulnerability and improve living conditions while promoting more effective and sustainable reconstruction. The approach uses the opportunity of having to rebuild after a disaster event to examine the suitability and sustainability of reconstruction practices.

[6] Fiscal year 2019 begins on 1 July 2018 and ends on 30 June 2019.

Recovery Needs by Sector
($ millions)

	Immediate Recovery Needs	Short-Term Recovery Needs	Medium-Term Recovery Needs	Total Recovery Needs
Productive Sectors	**17.4**	**5.8**	**3.0**	**26.3**
Agriculture	0.5	1.3	2.4	4.1
Commerce and industry	2.0	3.2	0.7	5.9
Tourism	15.0	1.3	NA	16.3
Social Sectors	**6.6**	**35.8**	**22.4**	**64.8**
Housing	2.7	33.2	18.7	54.6
Education	3.9	2.5	3.7	10.1
Health	0.0	N/A	N/A	0.0
Infrastructure Sectors	**7.2**	**1.2**	**40.5**	**48.9**
Energy	6.2	0.0	39.7	45.9
Public buildings	0.1	NA	0.3	0.5
Transport	0.3	0.7	0.4	1.4
Water and sanitation	0.6	0.5	NA	1.1
Employment, gender, and social protection	2.4	1.2	7.1	8.8
Total	**33.7**	**43.0**	**73.0**	**148.7**

NA = not applicable
Source: Kingdom of Tonga. 2018. *Post-Disaster Rapid Assessment, Tropical Cyclone Gita.* Nuku'alofa.

11. TPL made immediate temporary connections to repair the network, but while all 17,782 customers in Tongatapu were reconnected, the temporary connections are less resilient to extreme weather and storms than the previous connection were, and in the current condition, the network would not be able to withstand another storm. The old service lines are now connected with several joints, making them more susceptible to faults. During the first full month of operations with temporary connections (April 2018), the network experienced more than double the average number of monthly faults in 2017. TPL predicts that the power outages will become more frequent as the temporary connections deteriorate further. As the project area also includes essential services such as the hospital, the final reconstruction and upgrades should be done as soon as possible, to minimize secondary impacts on the economy and to restore reliable power supply.

12. The total cost of recovery and reconstruction for the energy sector alone is estimated at about $45.9 million and includes (i) the cost of immediate works ($6.2 million) to reestablish electricity supply to Tongatapu and 'Eua; and (ii) medium-term disaster resilience rehabilitation of power grid infrastructure assets on Tongatapu (estimated at $39.7 million), to be realized under the Nuku'alofa Network Upgrade Project (NNUP). After contributions from the government's emergency fund (about $3.3 million) and New Zealand ($2.1 million for immediate repairs, and $7.7 million for reconstruction), $34.5 million remains unmet.

D. ADB's sector experience and focus of emergency assistance

13. TPL is an implementing agency for two ongoing ADB projects in Tonga: (i) OIREP, to install solar power generations and expand the electricity network in Ha'apai, Eua, and Va'vau Islands (footnote 4); and (ii) Cyclone Ian Recovery Project, to rehabilitate and climate- and disaster-proof the electricity network on Ha'apai Islands.[7] In response to the government's request, ADB's emergency assistance will finance reconstruction and "building back better" of priority areas of the Nuku'alofa electricity network, identified as the most affected by the cyclone. The project will restore access to reliable electricity supply, reduce losses, and upgrade the network to a higher standard of disaster resilience.

[7] ADB 2014. ADB 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant to the Kingdom of Tonga for the Cyclone Ian Recovery Project.* Manila.