The World Bank

SUSTAINABLE ENERGY DEVELOPMENT AND ACCESS PROJECT (P165183)

Combined Project Information Documents /

Integrated Safeguards Datasheet (PID/ISDS)

Appraisal Stage | Date Prepared/Updated: 13-Nov-2018 | Report No: PIDISDSA25986

The World Bank

SUSTAINABLE ENERGY DEVELOPMENT AND ACCESS PROJECT (P165183)

BASIC INFORMATION

OPS_TABLE_BASIC_DATA

A. Basic Project Data

Country Project ID Project Name Parent Project ID (if any)

Micronesia, Federated States of P165183 SUSTAINABLE ENERGY

DEVELOPMENT AND

ACCESS PROJECT

Region Estimated Appraisal Date Estimated Board Date Practice Area (Lead)

EAST ASIA AND PACIFIC 01-Oct-2018 06-Dec-2018 Energy & Extractives

Financing Instrument Borrower(s) Implementing Agency

Investment Project Financing Federated States of Department of Resources

Micronesia, Department of and Development (DR&D;)

Finance and Administration

(DoFA)

Proposed Development Objective(s)

To improve reliability of electricity supply, expand access to electricity, and scale up renewable energy generation.

Components

Improving Reliability of Electricity Supply in Pohnpei State

Expanding Access to Electricity in Chuuk State

Scaling up Renewable Energy Generation in Chuuk, Yap and Kosrae States

Institutional Strengthening and Capacity Building in the Energy Sector

Technical Assistance and Project Management

PROJECT FINANCING DATA (US$, Millions)

SUMMARY -NewFin1

Total Project Cost 30.00

Total Financing 30.00

of which IBRD/IDA 30.00

Financing Gap 0.00

DETAILS -NewFinEnh1

World Bank Group Financing

The World Bank

SUSTAINABLE ENERGY DEVELOPMENT AND ACCESS PROJECT (P165183)

International Development Association (IDA) 30.00

IDA Grant 30.00

Environmental Assessment Category

B-Partial Assessment

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country Context

1. The Federated States of Micronesia (FSM) is a small, remote, geographically dispersed Pacific Island

Country (PIC). Similar to many PICs, the FSM faces significant inherent structural challenges to

developing an economy that can sustain government functions and effective service delivery. The FSM

has a population of approximately 102,453 scattered over an ocean area of 3.0 million km2. The

country is heavily reliant on external assistance, with on-budget grant income estimated to account

for 47.4 percent of total revenues (32.6 percent of gross domestic product [GDP]) in 2016. The FSM

has few resources, and exports are heavily concentrated on fish. High import dependency exposes the country to global economic shocks and price spikes. The FSM is particularly vulnerable to accelerated sea-level rise and is prone to natural hazards.

2. A sovereign country since 1986, the FSM is a federation that gives significant power to the four state governments—Pohnpei, Chuuk, Kosrae, and Yap. Each state has its own executive and legislative bodies and exercises considerable autonomy to manage its domestic affairs. Most public services are delivered at the state level. The FSM maintains deep ties and a cooperative relationship with the United States through the Compact of Free Association. Due to the federal structure and large geographical distances, accomplishing policy decisions at the national level is complex, as consensus across the national and the state governments is required.

3. While domestic revenue has grown in recent years, mainly driven by higher fishing royalties, the FSM remains heavily dependent on aid—primarily through the Compact of Free Association—to meet both recurrent and development financing needs. As mentioned earlier, grants contributed 47.4 percent of total revenue in 2016. By comparison, they contributed 55.6 percent in 2004. Since 1986, the Compact has provided large external financial transfers to support the Government in delivering key services, particularly education and health and substantial public sector investment at the state level. Under an Amended Compact Agreement, the FSM has been receiving payments of an inflation-adjusted US$92.7 million per year starting in 2004, with US$76.2 million in the form of grants, US$16.0 million to be placed in a Compact Trust Fund, and US$0.5 million for an annual audit. After the Amended Compact Agreement expires in 2023, investment income from the Compact Trust Fund is expected to replace the grants.

4. The Government of the Federated States of Micronesia (GoFSM) is currently facing a challenging

socioeconomic and fiscal situation. This is characterized by a decreasing population due to out-migration, which has had an impact on the supply of a skilled labor force; limited economic growth prospects; and real reductions in the Amended Compact Grant fund flows, culminating in limited opportunities for domestic revenue generation. Even under optimistic growth projections, the FSM will still face a significant shortfall in public finances from FY24 due to reduced funding of the Compact

Trust Fund. An additional fund, the FSM Trust Fund, was created by Congress in 1999. The National

Government has made significant contributions to the FSM Trust Fund over the last three years because it has become clear that the Compact Trust Fund will not provide sufficient income in FY24 to replace the Compact Sector Grant funding levels. Helping address this situation through strengthening public financial management and increasing domestic revenues will be crucial for the FSM's long-term fiscal sustainability.

5. The FSM's heavy dependence on imported petroleum fuels makes the country highly vulnerable to

petroleum price volatility and shocks. The country currently spends about US$40 million annually on

imported fuels, which represents over 50 percent of the aggregate sectoral grants that the nation receives from the United States under the Amended Compact Agreement, and nearly 15 percent of nominal GDP, making energy the costliest sector of its fragile economy. The nation's fuel storage and

wholesale distribution facilities are operated by the state-owned enterprise FSM Petroleum Corporation (referred to as PetroCorp and commercially known as 'Vital').

6. Climate change represents a serious threat for the FSM because of rising air and ocean temperatures, changing rainfall patterns, sea-level rise, and ocean acidification. Ocean acidification and increased sea-surface temperatures directly harm marine ecosystems, especially coral reefs, having negative consequences for fisheries. The Pacific Ocean has experienced some of the highest

rates of sea-level rise which drives coastal erosion, increases the risk of flooding and salinization, and

limits the availability of food and water. In addition, the western edge of the Micronesia Region is the

most active tropical cyclone basin in the world: on average, 28 tropical storms and typhoons occur

annually, causing damage to infrastructure, flooding, and drainage complications. Climate projections

indicate that droughts will occur less frequently; however, the incidence of extreme rainfall events is

expected to increase.

7. Gender inequality is pronounced in the FSM—the country ranks 124 out of 187 countries in the

United Nations Gender Inequality Index.1 Two gender gaps are specifically relevant for the electricity

sector and the Sustainable Energy Development and Access Project (SEDAP). First, in terms of access

to jobs and promotions, men surpass women in all fields of employment. According to the last

available data (2007), nationwide only 38 percent of employees in the private sector are female, and

in the public sector only 29 percent of employees are women.2 Not only are women less represented

in the paid workforce, they are concentrated at the lower levels of the hierarchy, with comparatively

lower pay. This is also reflected in the energy sector in the FSM. The second gender gap relevant to

the project relates to the health consequences of open fire as a primary means of household energy

for cooking. Women—whether employed or not—continue to be responsible for most of the burden

of household labor, including the preparation and cooking of food. Preliminary data indicate that

around 90 percent3 of non-urban households in Chuuk cook predominantly on open fires, exposing all

household members—but primarily women—to toxic particulate matter.

8. The joint IBRD/IDA/IFC/MIGA4 Regional Partnership Framework (RPF) for FY17–FY21 outlines the

World Bank Group’s strategic program for nine Pacific Island Countries (PIC9),5 including the FSM.

Adopted in 2017, the RPF focuses on World Bank Group interventions to support the efforts of PIC9

in strengthening macroeconomic management, improving access to basic services and connective infrastructure, and addressing knowledge gaps. The RPF builds upon the deepening engagement with Samoa, Tonga, and Kiribati and the ability to channel significantly more resources to the FSM, the Marshall Islands, Vanuatu, and Tuvalu. This framework has been established at a time when IDA support to the PICs is rising to unprecedented levels. The unique features that define PIC9, and which consequently have a direct bearing on their development agendas, are their small size (they are among the 25 smallest independent states on earth), remoteness, geographic dispersion, environmental fragility, and high degree of exposure to a volatile mix of economic shocks, climate change, and natural disasters. The FSM is ranked 122nd worldwide for hazards and exposure.

1 A composite measure reflecting inequality in achievements between women and men in three dimensions: reproductive health, empowerment, and the labor market. Sourced from the United Nations Development Programme's Human Development Report Office, 2013. http://hdr.undp.org/en/content/gender-inequality-index.

2 SPC (Secretariat of the Pacific Community). 2012. Stockage of the Gender Mainstreaming Capacity of Pacific Island Governments - Federated States of Micronesia. New Caledonia. ISBN: 978-982-00-0524-2. While there is considerable variation across the states, a 2012 gender stock-taking carried out by the SPC reported that male employment levels surpassed women in all fields of work.

3 This figure is from a rapid assessment made during the Gender Mission to the FSM in June 2018 where 18 households in Chuuk were interviewed on cooking practices.

4 International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA).

5 Report No. 120479, January 1, 2017. PIC9 include Kiribati, the Marshall Islands, the FSM, the Republic of Nauru, the

Republic of Palau, Independent State of Samoa, Kingdom of Tonga, Tuvalu, and Vanuatu. Eight of these countries

are IDA eligible and have seen a substantial increase in World Bank Group presence and engagement in recent years.

Sectoral and Institutional Context

9. Government vision and objectives - National Energy Policy (NEP) and Energy Master Plan (MP). The

FSM's NEP was developed in 2012, setting the country's energy policy framework and actions at the

national and state level to achieve its objectives regarding four primary components: Policy and

Planning, Conventional Energy (fossil fuel), Energy Efficiency and Conservation, and Renewable Energy

(RE). The MP, financed by the ongoing World Bank Energy Sector Development Project (ESDP), was

recently completed and adopted by the Government in April 2018. The MP sets out a technically

feasible, financeable, and implementable pathway for each state to provide a reliable and

environmentally sustainable electricity service to all residents. The plan's target is providing electricity

access to more than 80 percent of FSM households by 2020 and to almost every household by 2023.

The plan seeks to achieve the FSM's objectives to deploy RE, decrease diesel consumption, and reduce

greenhouse gas (GHG) emissions.

10. Sector institutions. The Department of Resources and Development (DoR&D;) is responsible for

assisting the states of Chuuk, Kosrae, Pohnpei, and Yap to develop their economies by focusing on the

four priority sectors: energy, fisheries, agriculture, and tourism. The Energy Division of the DoR&D;

(ED/DoR&D;) oversees the energy sector and includes the assistant secretary and a part-time energy

adviser and project implementation officer funded through the ESDP. The ED/DoR&D; performs the

following functions: policy formulation, research on RE potential, coordination among state

governments on sustainable use of fuel, and coordination with regional and international

counterparts.

11. A National Energy Workgroup (NEW) oversees the activities in the energy sector, especially the

implementation of the NEP. The NEW comprises members of key departments in the National

Government and interacts closely with the state power utilities. The NEW also interacts with the four

State Energy Workgroups6 responsible for (a) overseeing and coordinating all state efforts in the

energy sector, (b) implementing State Energy Action Plans aligned with the NEP, (c) advising the state

governments on energy issues, and (d) assisting in the design and development of energy efficiency

and RE projects for the consideration, funding, and implementation of development partners.

12. The states' autonomy to manage domestic affairs has resulted in four different public utilities

responsible for power generation, transmission and distribution, and water and wastewater systems.

The utilities are the Pohnpei Utilities Corporation (PUC), Chuuk Public Utility Corporation (CPUC), Yap

State Public Service Corporation (YSPSC), and Kosrae Utilities Authority (KUA). These four utilities are

autonomous and report to their respective state governors. Each utility has its own tariff structure

and is regulated by the Utility Board at the state level.

6

State Energy Workgroups comprise three or four people: one from the state government, one from the utility,

the state energy officer or an energy expert, and one from the private sector or a nongovernmental organization.

13. The presence of independent power producers (IPPs) in the FSM is currently limited to Vital's 2 MW

power purchase agreement (PPA) with PUC in Pohnpei. The existing PPA does not bring any

competitive advantage in the region. The country suffers from high electricity costs on the main

islands and even higher costs on the outer islands due to a geographically scattered territory and sector fragmentation that typically preclude economies of scale.

14. Demand and supply. Currently, RE (small hydro and solar photovoltaics [PV]) constitutes 9.33 percent of the FSM's electricity generation mix, while petroleum-based fuels account for 81 percent. In the first semester of 2018, the commercial and industrial end-use sector was the largest consumer of electricity (35 percent), followed by the Government (28 percent) and the residential sector (20 percent). The remaining 17 percent was attributed to system's losses. The largest uses of electricity are air conditioning and lighting. Energy demand in rural areas reflects basic needs, such as lighting (often with kerosene, oil lamps, and flashlights) and cooking (wood and other biomass, such as coconut husk, and kerosene with dropping consumption due to cost increases). This is reflected in the monthly expenses in electricity, at US$35 in the main island and only US$15.37 in the outer islands. Specific information on 2017 demand and supply in each of the four federated states is presented in table 1.

Table 1. Electricity Demand and Supply

States	Peak Load (MW)	Growth (%)	Installed Capacity (MW)	RE (%)
Pohnpei	6.6	4.50	13.93	7
Chuuk	2.7	1.61	8.04	3
Yap	2.3	1.49	7.23	22
Kosrae	1.2	1.78	6.15	8

15. The key sector issues (KSIs) are the following:

• Reliability of supply (KSI 1). PUC's installed capacity is superficially higher than the peak demand. Due to deterioration of unit conditions and maintenance needs, the actual supply capacity is way below the installed capacity. In fact, PUC is experiencing frequent and unscheduled generator shutdowns. As a result, PUC's performance in delivering electricity services is currently well below the standards achieved by CPUC, YSPSC, and KUA. The Pohnpei thermal power plant is equipped with high-speed gensets that are being operated for base load. This leads to the deterioration of the diesel units and their frequent breakdown.7 The plant will need medium-speed gensets, as confirmed by the MP and

Pohnpei energy assessment, to take the base load and reduce the breakdown and damage to the existing high-speed units.

7

Units purchased under emergency characterized by stringent load shedding which resulted in rating incompatibility with the load profile.

• Low electricity access rate in Chuuk (KSI 2). The electricity access rate is about 62 percent of all households in the FSM. Chuuk, where 47 percent of the population resides, lags the other states with the lowest access rate at 27 percent (see table 2). The MP and the Whole of State Electrification Outline Plan prepared by CPUC seek to address this major issue. However, there is a major lack of funding to expand access to electricity. Where the grid is accessible, the one-off cost of connection (US$40) remains one potential barrier prohibiting poorer households from gaining access.

Table 2. FSM Population, GDP, and Electrification Rate by State, 2018

State	Population (%)	GDP (%)	Electrification Rate (%)
Pohnpei	35	47	95
Chuuk	47	28	27
Yap	11	17	87
Kosrae	7	8	95

• Financial and system constraints to develop RE investments (KSI 3). The four utilities are currently expanding RE generation capacity mainly through external assistance from development partners. Although some RE-based solutions are already a cost-competitive alternative to diesel generation, CPUC does not have enough financial capacity to scale up RE generation, whereas solar and wind power plants in YSPSC and KUA are occasionally curtailed due to system constraints, thus the need for solutions such as battery storage and high-speed gensets to accommodate existing wind and solar capacity in Kosrae and Yap.

Extension of main grids through undersea cables to nearby islands in Chuuk could foster RE development; however, this option would require a high up-front capital investment.

• Overdependence of electricity sector on imported fuels (KSI 4). The FSM is heavily dependent on imported petroleum fuels, resulting in (a) high generation costs of electricity in the FSM compared to an international benchmark for island utilities (Figure 1 shows that for all four utilities, fuel cost is the largest component of cost per unit of electricity sold) and (b) high vulnerability to oil price volatility in the country, including price shocks that would result in higher electricity prices. Such vulnerability adds uncertainty in the energy sector, complicating long-term planning. The deployment of RE technology and improvements in energy efficiency can reduce the fossil fuel dependence, increasing the energy security in the country.

• High cost of electricity supply (KSI 5). In the four states, tariffs are relatively high compared to international standards, mainly due to the high cost of fuel. In spite of this, the states' utilities do not fully recover their operation and maintenance (O&M;) costs and, consequently, have difficulties financing new power infrastructure. These challenges are particularly acute for PUC, which has higher investment needs due to the large size of generation assets and their deficient maintenance so far. Current average electricity costs and tariffs in the FSM are presented in table 3. The available cost of electricity supply in table 3 reflects total operating expenses divided by electricity sold. These figures do not account for revenue gap due to cross-subsidy between electricity and water and sewage.

Table 3. FSM Average Electricity Costs and Tariffs, 2016

States	Residential Tariff	Commercial and Public	Average Electricity Revenue Collecteda	Government and	Weighted Average Cost of Electricity

Industrial Authorities Supplied

(US$) Tariffs (US$/kWh)

Tariff (US$) Tariff (US$) (US$/kWh)

(US$/kWh)

Pohnpei 0.39 0.39 0.39 0.39 0.31 0.32

Chuuk 0.41 0.44 0.46 0.44 0.36 0.33

Yap 0.41 0.49 0.77 0.63 0.58 0.38

Kosrae 0.44 0.48 0.52 0.48 0.43 0.37

Note: a. Inclusive of collection and distribution losses (distribution losses: PUC-21 percent, CPUC-17 percent,

YSPSC-8 percent, and KUA-10 percent).

Figure 1. Utilities' Costs of Electricity Suppliedb

Source: MP.

Note: b. For all four utilities, fuel cost is the largest component of cost per unit of electricity sold (electricity costs

are without provision for investments). YSPSC and KUA are particularly vulnerable to fuel cost compared to the other

utilities; fuel cost correction is not built into tariffs.

• 'Build-neglect-replace' paradigm (KSI 6). These weaknesses, combined with the lack of spare parts inventory and asset management systems, proper cost accounting, recurrent budget planning, and allocations for regular maintenance, have resulted in a 'build-neglect-replace' paradigm, in which generation infrastructure is inadequately maintained and must be replaced before the end of its normal operating life, though the recent trend is encouraging for some of the utilities. In addition, particularly for PUC, the relative abundance of donor financing for new capital purchases drives the recurrence for this approach.

• Low representation of women in technical roles within the sector's workforce (KSI 7). State

utilities face acute challenges in recruiting, training, and retaining qualified technical staff. At the same time, there is a perception that women in the FSM have not considered these types of roles as viable career options nor have they been encouraged to pursue these roles by family or potential employers. For example, PUC and CPUC do not have technical roles undertaken by women. In general, women present an untapped labor pool for utilities. Most roles in utilities are filled by employee referral or word of mouth, neither of which is effective in reaching women as they are not part of the workforce.

• About 42 percent of the FSM's population is affected by household indoor air pollution (IAP) (KSI 8). Only 10.6 percent of the population uses electricity for cooking. A significant amount of the population uses kerosene (44.1 percent) or wood (41.5 percent) and a few use liquid petroleum gas (3.6 percent) and other fuels (0.2 percent). Burning solid fuels in traditional stoves emits smoke that contains large quantities of particulate matter and gaseous pollutants. Switching to clean fuels has been identified as the most effective way of reducing IAP. More efficient stoves and improved ventilation conditions can also considerably reduce IAP. Inefficient combustion of traditional biomass results in high levels of IAP due to the particulate matter and carbon monoxide, hydrocarbons, formaldehyde, and benzene released.

16. Private sector participation. Both the NEP and the MP recognize private sector participation as an important driver for financing the sector, including the deployment of RE technology. However, none of the four states has yet been able to attract private sector investment to develop renewable generation at a reasonable cost. Moreover, the private sector faces many challenges in the energy sector and, generally, is weak in the region. Table 4 shows the percentage of IPP generation for 22 utilities in 2015. The proposed project will therefore also support the GoFSM in assessing and identifying challenges that are preventing private sector participation to maximizing financing for development (MFD).

Table 4. Percentage of IPP Generation in the PICs8

EEC HECO GPA PPL PUC EDT FEA Others

95 47 41 37 11 1 1 0

17. Provision of public sector financing. As of 2018, the marginal productivity of capital in the private sector in the FSM is extremely low. This is due to the islands' remoteness, their small size, and geographic dispersion, which hinder economies of scale and the development of profitable private enterprises. In this environment, public investment in basic infrastructure can improve business conditions and ease constraints to private sector development. Such is the need for additional investments, that it is unlikely that public investments displace private funds. In fact, public investments are likely going to catalyze private investments in the FSM.

8

EEC-Electricité et Eau de Calédonie; HECO- Hawaiian Electric; GPA-Guam Power Authority; PPL-PNG Power Ltd.;

EDT- Electricité de Tahiti ; FEA-Fiji Electricity Authority

18. World Bank Group support. The World Bank Group is one of the key partners supporting the GoFSM in its efforts to establish conditions for sustainable and reliable energy provision for economic growth and poverty alleviation. The World Bank currently implements the ongoing ESDP to help the country achieve its long-term sector goals. This project is aligned with the four state MPs, which identified various investments and options to increase electricity access and improve quality of electricity service in each state. Approved in 2014, the ESDP's goal is to increase available generation capacity and efficiency of electricity supply and strengthen the technical capacities of the National Government and the state power utilities.

19. World Bank Group value added. The value added does not only lie in the financing and the convening power to mobilize funds from donors and leverage private investments but also in the provision of technical assistance (TA) and capacity building, which are key components of the World Bank's

support to, and partnership with, the FSM and which help ensure the sustainability of projects. The World Bank Group, as a global organization, can also apply the global and regional knowledge and experiences to support the energy sector development in the FSM.

20. Donor support and coordination. Other donors are actively supporting the FSM's energy sector development strategy and goals generally through investment projects: the World Bank Group, the Japan International Cooperation Agency (JICA), the European Union (EU), the Asian Development Bank (ADB), and the New Zealand Government. The World Bank Group is maintaining close coordination with the Government and consultations with these development partners to avoid overlap and duplication. Tables 5 and 6 present the donors' investments and areas of cooperation in

the country.

Table 5. Energy Sector Financing (US$, millions)

Development Partner	Global Environment Facility	World Bank	United States	EU	ADB	JICA	New Zealand	All
Ongoing	14.4	—	9.0	1.2	10	—	1	35.6
Planned 2019	30.0	12	12.5	—	—	2	—	56.5
Total	44.4	12	21.5	1.2	10	2	1	92.1

Table 6. Donors' Involvement

Development Partner	Global Environment Facility	World Bank	United States	EU	ADB	JICA	New Zealand
Thermal generation	X	—	X	X	X	—	—
Access	X	X	X	—	—	—	—
RE	X	X	X	—	—	—	X

Governance and reform X X X X — — —

Energy efficiency X X — — — X —

Capacity building X X X X X X —

21. A Working group of donors and investors was formed to secure the financing needed to start the

implementation of the MP in 2019. In April 2018, the ESDP supported a round table with the Working

Group, which currently includes the World Bank Group, ADB, the United States, the Bank of Guam,

SPC, Secretariat of R&D;, Division of Energy, Vital (IPP in Pohnpei), Castalia, PUC, CPUC, KUA, and

YSPSC. The MP tracks the development of the FSM energy sector over the next 20 years, with close to

US$300 million of investments. The MP estimates that approximately US$100 million of investments

will be required in the next 5 years.

C. Proposed Development Objective(s)

Development Objective(s)

To improve reliability of electricity supply, expand access to electricity, and scale up renewable energy generation.

Key Results

22. The proposed activities are designed to achieve the practical outcomes of improving the reliability

of electricity supply, expanding access to electricity, and scaling up RE generation. At the same time, these

outcomes contribute toward achieving the long-term goal of increasing access to basic services and

improving connective infrastructure, as specified in the RPF FY17–FY21. Figure 2 represents this theory of

change.

Figure 2. Theory of Change

In broader terms, the project is also expected to significantly and positively affect (a) productivity due to improved

access to modern electricity services and reliable electricity supply, (b) the economic activities and growth of the outer

islands of the FSM, and (c) environmental externalities.

D. Project Description

PDO Level Indicators

23. PDO indicators are included in table 7.

Table 7. PDO Indicators

PDO Indicators Unit of Measure

PUC System Average Interruption Duration Index (SAIDI) in Pohnpei Minutes

People newly provided with access to electricity under the project by household Number of people

connections to grid/off-grid/mini-grid in Chuuk

Annual generation output of renewable energy (other than hydropower) in Chuuk, Yap, MWh

and Kosrae

Project Components

24. The proposed project will address the eight KSI identified above by (a) improving reliability of

electricity supply in the state of Pohnpei; (b) expanding access to electricity in the state of Chuuk; (c)

scaling up RE generation in Chuuk, Yap, and Kosrae; (d) supporting institutional strengthening and

capacity building in the energy sector; and (e) providing TA and project management.

25. The project will comprise the five components listed in table 8 with their respective budget allocation

(including contingencies).

Table 8. Project Components and Budget

KSI to be Budget (US$,

No. Component

addressed millions)

1 Improving Reliability of Electricity Supply in Pohnpei State KSI 1 11.80

2 Expanding Access to Electricity in Chuuk State KSI 2 3.45

3 Scaling up Renewable Energy Generation in Chuuk, Yap, and Kosrae States KSI 3 9.90

4 Institutional Strengthening and Capacity Building in the Energy Sector KSI 4–8 1.90

5 Technical Assistance and Project Management All the above 2.95

Total 30.00

26. Component 1: Improving Reliability of Electricity Supply in Pohnpei State (IDA US$11.8 million). This

component will address PUC's challenges with insufficient available generation capacity, which is way

below the installed capacity, to cover peak demand in a stable manner and reduce unscheduled

shutdowns of power supply and unsecure waste oil storage. The component will finance (a) medium-

speed diesel gensets of about 7.5 MW total, which will serve base load and provide appropriate

redundancy; (b) consultancy for technical specifications and analytical work, maintenance and

supervision of works; (c) associated grid facilities in Pohnpei to improve the operational performance

and generation capacity of PUC; (d) waste oil storage tank and spill containment; (e) removal of

obsolete generation equipment; and (f) electromechanical and electronic equipment, such as a power

system supervisory control and data acquisition (SCADA), measuring, monitoring, and protection

devices, and converters to help PUC improve its operational performance.

27. Component 2: Expanding Access to Electricity in Chuuk State (IDA US$3.45 million). This component

will support CPUC to expand access to electricity in Chuuk State, where the access rate is the lowest

in the country (27 percent) due to the remoteness of several islands. Specifically, this component will

finance (a) the construction of mini-grid systems in the islands of Udot and Satowan; (b) the

installation of solar home systems (SHS) in off-grid project areas; the criteria and procedures for

selecting the homes to be fitted with SHS are provided in the MP; and (c) consultancy work for analytical work on power grid and supervision of works. Udot and Satowan are prioritized based on their high population with underserved energy needs, the cost-effectiveness of the investments, customers' affordability, and the alignment with other donors' programs and the Energy MP for the FSM.

28. Component 3: Scaling up Renewable Energy Generation in Chuuk, Yap, and Kosrae States (IDA US$9.9 million). This component will support CPUC to install the state's first utility-scale solar power plant to reduce fuel cost of diesel-based power generation and relieve CPUC from the financial burden incurred by access expansion on the outer islands. The component will also support YSPSC and KUA to significantly mitigate the curtailment of the existing RE output and enable the integration of more variable RE through storage capacity and high-speed gensets.

29. The component will finance (a) a 2 MW solar PV power plant in Weno,9 (b) the installation of about 1 MWh10 of battery capacity and energy management system for KUA, and (c) the installation of an 830 kW11 high-speed genset and related ancillary facilities in the existing diesel power plant in Yap. For each of these investments, the component will also finance consultancy work for analytical work on power grid and for supervision during the project implementation.

9 CPUC has already identified the land for 2 MW scale solar PV.

10 KUA has already experienced the curtailment of solar power but has an intention to overcome this issue and scale up RE. The battery size will be designed to accommodate the existing solar power and the foreseeable future solar power. The size will further be refined after detailed study is completed.

11 YSPSC has recently installed wind turbines and has a plan to install further RE systems. However, this could cause

some difficulties in frequency control. The MP suggests adding 830 kW scale high-speed genset for stable power

supply.

30. Component 4: Institutional Strengthening and Capacity Building in the Energy Sector (IDA US$1.9

million). This component aims at reinforcing the sector's operational and environmental sustainability

by improving institutional capacities for governance, identifying strategies to attract private sector

investments, and exploring access to other efficient energy solutions.

• Subcomponent 4.1: Sector Governance. This component is designed to improve sector

governance and financial performance, achieve self-sustainability, and improve assets

maintenance strategies. Specifically, this subcomponent will support the following activities:

(a) PUC's O&M; fund and Performance Contract (PC).12 PUC's O&M; capacity and corporate

functions will be reinforced through the establishment of an O&M; fund that will ensure

sustainability. The O&M; fund shall cover, at least, PUC's generation assets financed by

the ESDP and the SEDAP and be set up within 18 months of project effectiveness. A

consultant will be recruited to propose the rules, guidelines, and procedures regulating

the funding and disbursement of this account; project fund cannot be deposited into

this fund. This subcomponent will also include the signature, implementation, and

monitoring of a PC. Once the O&M; fund and PC are established in PUC, similar schemes

in each utility will be expected. Further information about the O&M; fund and the PC is

available in section III.C. Sustainability.

(b) Analytical work and TA. An assessment on the energy sector readiness for private

sector participation will be conducted under this subcomponent. Among other

strategies, the assessment will explore the potential of private-public partnerships to

enable solutions to maximize finance for development for future projects. Some

recommendations arising from this assessment may also be financed under this

component. A preliminary identification of other potential themes to cover through this TA include (a) instruments to create an institutional, legal, and regulatory framework conducive to a self-sustained sector; (b) assessments for competitive and gender-neutral selection of key management positions and the participation of independent administrators in the Board; (c) a collaboration program with local schools, colleges, and media that encourages increasing the numbers of female candidates who apply for technical vocational roles; and (d) utility financial recovery plans, if needed.

12

A PC, agreed by relevant parties (PUC, Pohnpei State, and others) to be implemented and monitored based on the recommendations provided by the Graduates School United States' report on PUC.

• Subcomponent 4.2: Efficient and Clean Cookstoves. This subcomponent will finance (a) a detailed household survey assessment of the challenges and opportunities for intervention in selected islands of the FSM to address health (gender-disaggregated), environmental, livelihood, gender, and climate change issues associated with household energy for cooking; the criteria and procedure for selecting islands for the cookstoves survey assessment will be specified in the PIM; (b) awareness campaigns through (i) social mobilization to ensure that potential users are aware of the fuel-saving and health benefits associated with efficient and clean cooking and (ii) potential cooking demonstration workshops using different types of efficient and clean cookstoves and fuels to test consumer preferences and willingness to adopt and to purchase them; and (c) preparation of documentation necessary to identify and design a large-scale intervention on household energy for cooking in the FSM, which considers women's health benefits and employment opportunities, that may support an operation for the dissemination of clean cookstoves in the future.

31. Component 5: Technical Assistance and Project Management (IDA US$2.95 million). This component

will finance (a) contract staffing for the project, including a project manager, consultancies and non-

consultancies, office and other equipment, travel, and operational costs; (b) training and workshops;

(c) recruitment of a full-time energy adviser to assist and support the Secretary of Resources and

Development (SoR&D;) on energy sector policy matters and development strategy; (d) support to

utilities on respective activities implementation, including support on coordination, monitoring and

evaluation (M&E;), and reporting; and (e) capacity building for local experts through technical transfer

and on-the-job training with international consultants.

E. Implementation

Institutional and Implementation Arrangements

32. R&D; is responsible for overall project preparation and implementation. A Project Implementation

Unit (PIU) will be established within the ED/DoR&D; and include a project manager and support staff and

will be supported by CIU staff including a financial management (FM) specialist, a procurement specialist,

and a safeguards specialist. The procurement specialist, FM specialist, and the safeguards specialist are

the CIU's personnel and support the implementation of various IDA-financed projects, including this one.

The PIU will coordinate the implementation of the project with the ED/DoR&D;, the states, and the utilities

in a manner that is to be set forth in the Memorandum of Understanding (MoU) that outlines the roles of

each organization. The PIU will also be responsible for preparing and implementing the project in

accordance with annual work plans and budgets, which will detail the project activities and eligible

expenditures. The MoUs will clarify, among others, the necessary state and intra-government cooperation

and support necessary for the project.

33. The project manager will be responsible for overall project coordination and technical guidance

and will support the procurement of the various procurement packages and studies. The project manager

will report to the assistant secretary at the ED/DoR&D; and to the Project Steering Committee (PSC). The

CIU, as the unit coordinating all related procurement and financial matters, will be responsible for the

project's fiduciary aspects. The CIU will be a functional unit within the DoFA and support the

implementation of the Bank's portfolio. Additional procurement and safeguards support may also be

considered, if needed.

34. A PSC will be established and comprise, among others as may be required, the Secretary of DoFA,

the SoR&D;, a representative of the PIU, a representative of the CIU, ED/DoR&D;, the CEOs of each of the

state utilities, and the chairs of the state energy working groups. The PSC will be established within three

months of effectiveness and will provide oversight and strategic guidance during project implementation,

in accordance with the terms of reference of the PSC. The SoR&D; will chair the PSC.

35. A Project Implementation Manual (PIM) will be prepared by the PIU and the CIU and adopted by

the PSC not later than three months after effectiveness and will include (a) institutional arrangements for

day-to-day execution of the project; (b) the Procurement Plan and implementation arrangements; (c)

guidance on implementation of safeguard instruments and GRM; (d) budgeting, disbursement, and FM

processes; and (e) project monitoring, reporting, evaluation, and performance indicators including

implementation of, and compliance with, World Bank safeguard policies.

36. An Engineering Unit will be created within each utility to provide daily support to the

implementation of the SEDAP. These units will be composed of the utility's owner's engineer, as well as

dedicated staff who will support construction and supervision. The project manager will work with the

Engineering Unit to coordinate and ensure sound project implementation according to the role's scope of

work.

37. Table 9 lists the units involved in implementation and supervision; the CIU will provide support

through the recruited procurement specialist, FM specialist, safeguards specialist, monitoring and

evaluation officer, and communication staff.

Table 9. Implementation and Supervision Units

Unit Staff

PIU Project Manager, support staff

PUC-Engineering Unit Owner's Engineer, PUC-SEDAP dedicated staff

CPUC-Engineering Unit Owner's Engineer, CPUC-SEDAP dedicated staff

YSPSC-Engineering Unit Owner's Engineer, YSPSC-SEDAP dedicated staff

KUA-Engineering Unit Owner's Engineer, KUA-SEDAP dedicated staff

.

F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

Most energy generation and storage investments, and improvements to operations and maintenance, will

be implemented within the utility compounds in each State. Solar electricity generation in Chuuk may be

located on government buildings and /or private custom-owned land on the main island, Weno. A solar and

diesel hybrid mini-grid will be located on a small island in Chuuk Lagoon (Udot) and network expansion will

occur on Satawan, an atoll located about 300km south of Weno. The location of the support to clean cook

stoves will not be known until project implementation but likely to be at least in Chuuk State. Land

acquisition can be difficult and time consuming due to the customary nature of land ownership in the States

(many land owners and not all land owners may be identified on records or able to be located) however

negotiated land leases by State Utilities have been achieved in the past and is a viable option for for SEDAP

under State law. Since lease options are available and locations for investments can be flexible, involuntary

land acquisition is unnecessary. The Udot mini-grid is likely to be located on Government land in the village

and distribution lines will be prioritized on road reserve.

G. Environmental and Social Safeguards Specialists on the Team

Penelope Ruth Ferguson, Environmental Specialist

Ross James Butler, Social Specialist

Nathalie Suzanna Noella Staelens, Environmental Specialist

SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies Triggered? Explanation (Optional)

The projects include solar energy generation, grid

extensions (poles and cables), new / replacement of

diesel generation sets, and solar/diesel hybrid mini-

grids (including distribution).

The environmental and social impacts may include

the potential for: health and safety and community

safety issues during construction, including the

potential for harassment or abuse of local women

from imported labor; fuel management; waste

management; protocols for removing and disposing

old equipment; avoiding physical cultural resources

Environmental Assessment OP/BP 4.01 Yes and natural habitats through good site selection; and

management of waste and stormwater run off from

civil works. The benefits include electrification and

more reliable electricity supply and renewable

energy generation. Renewable energy investments

will avoid additional air emissions from diesel and

reduce the risk of oil and fuel spills and contamination, and improving access may substitute gas or wood energy sources in the home.

Supporting the increased use of clean cookstoves is likely to result in which, in the long term, will contribute to decreasing deforestation and destruction of mangroves, resulting in maintaining natural defenses for flooding and coastal erosion.

OP4.01 is triggered. The project is screened as Category B as the impacts are considered minor to moderate and readily prevented and mitigated. The specific locations of the Chuuk solar PV investments under Component 3 are not known and an ESMF provides a screening process to identify and manage risks during project implementation.

All other activities are covered by the ESMP, which provides key mitigation measures based on Good International Industry Practice for typical risks and impacts, even for mini-grid and distribution line extensions were the exact locations are not known prior to appraisal. If site specific risks are identified during implementation, the ESMP will be updated prior to Contractor tendering.

Environmental management measures from the ESMP and SEP will be integrated into the tendering

process, and the installation and operation of
equipment, and the TOR for technical advisory
activities.
Performance Standards for Private Sector
No The policy is not triggered.
Activities OP/BP 4.03
Small areas of land (a total of approximately 2-3ha)
will be required in Chuuk for solar investments, and
the location of infrastructure is flexible. The site
screening and selection process in the ESMF will
allow CPUC to avoid disturbances and other impacts
on natural habitats as much as possible. However,
due to the limited land availability on the small
island of Weno, and the other variables such willing
Natural Habitats OP/BP 4.04 Yes landowners, flat sites, good access to the grid etc.,
there is the possiblity that impacts on natural
habitats may not be avoidable, and mitigation
measures will be required. For example there are
some flat wetland areas on the island that may have
ecological values which could be affected by land
clearance and filling. The policy is therefore
triggered.

The ESMF requires an ESIA to be completed where
there will be moderate to significant impacts on
ecological services, natural habitats or threatened
species.

The ESMP has concluded that there are no risks to natural habitats from the remaining activities under SEDAP.

The project will not impact on the management of

Forests OP/BP 4.36 No forest resources and will not degrade or destroy forests.

This policy is not triggered because the project does

Pest Management OP 4.09 No not involve the control or management of pests nor the purchase and use of pesticides.

Small areas of land (a total of approximately 2-3ha) will be required in Chuuk for solar investments, and the location of infrastructure is flexible. The site screening and selection process in the ESMF will allow CPUC to avoid disturbances and other impacts on Physical Cultural Resources (PCR) as much as possible. However, due to the limited land availability on the small island of Weno, and the other variables such willing landowners, flat sites, good access to the grid etc., there is the possiblity that impacts on PCR may not be avoidable, and mitigation measures will be required.

Physical Cultural Resources OP/BP 4.11 Yes

The policy is therefore triggered.

The ESMF requires a PCR survey to be completed during the feasibility phase of the solar PV project and, if necessary, mitigation measures included in the project-specific ESMP.

The ESMP has concluded that there are no risks to

PCR from the remaining activities under SEDAP. The ESMP contains a process for avoiding PCR impacts in the design, construction and operation of the investments, and includes chance find procedures..

Almost the entire population of each state is indigenous. To ensure that the principles of the policy are addressed: The preparation of the ESMF,

Indigenous Peoples OP/BP 4.10 Yes

RPF and ESMP included a social assessment, and a community consultation process. It will undertake and an assessment of the particular issues for local

communities and assess the impacts and benefits on vulnerable and poor. A Stakeholder Engagement Plan (SEP) incorporates all elements of an Indigenous Peoples Plan, reflecting a Free, Prior and Informed Consultation approach that addresses the needs of vulnerable people and women, and focusses on beneficiary engagement in the design of mini-grids and improved access.

Small areas of land will be required for generation infrastructure, battery storage and distribution systems (poles and cables) on Government, church and / or private custom-owned land in Chuuk. Voluntary land negotiations, easements and land leases will be used. There will be no involuntary land acquisition or resettlement. Compensation for

lost assets will be paid where damage or loss is

unavoidable on private land as a result of pole and

cable installation or other physical investments. Site

selection is flexible and sensitive locations can be

Involuntary Resettlement OP/BP 4.12 Yes avoided. There is no expectation that livelihoods

will be adversely affected by the project.

No new land will be required in Pohnpei. The works

will be carried out within the existing PUC

compound and on the existing grid network.

A Resettlement Policy Framework will be prepared

to documents the voluntary land acquisition and

land lease arrangements, and the compensation

arrangements where loss of income or loss of access

to assets will result from land access.

The project will not fund the construction of a dam

Safety of Dams OP/BP 4.37 No or investments that rely on the safe operation of an

existing dam.

Projects on International Waterways

No

OP/BP 7.50

Projects in Disputed Areas OP/BP 7.60 No

KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential

large scale, significant and/or irreversible impacts:

There are no large scale, significant and / or irreversible impacts. The installation and operation of diesel electricity

generation may involve the removal of old equipment and waste oil, which will be removed offshore for proper

recycling and / or disposal. Mini-grid installation on Udot is likely to be on Government land, but will have minor risks

disturbances to the community from the installation activities, and ongoing risks from fuel and hazardous substances

management. The location of the installation of 2MW of solar panel generation infrastructure on Weno is unknown

but will go through a screening process to avoid significant impacts on natural habitats, physical cultural resources,

water quality or forests. The social benefits of improved access on Udot and Satawan, and improved reliability on

Weno, will be moderate to substantial. Solar generation on Chuuk is offsetting future emissions from diesel and will

allow the utility to divert funds to further invest in electricity access in remote areas of the State.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

There are no potential indirect and or long term adverse impacts anticipated, but there will be an ongoing offset of

emissions from solar generation and improved efficiency of diesel generation and ongoing benefits to new electricity

consumers.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

The FSM Energy Master Plan (2018) has evaluated and prioritized options for increased renewable energy penetration,

electrification and improved grid reliability in each of the four states. The master planning process integrated the

consideration of social and environmental issues and benefits. This project is funding the prioritized investment and

sector development options from the Master Plan and therefore no project alternatives have been assessed during

project design.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower

capacity to plan and implement the measures described.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of

borrower capacity to plan and implement the measures described.

The borrower engaged a consultant to prepare the ESMF,RPF and ESMP to provide mitigation measures in design,

installation and operation of infrastructure and to provide guidelines for integrating safeguards into the technical

advisory support such as Component 4 (Enhancing Sector Governance) and the Clean Cookstoves assessment and

dissemination. DoFA is in the process of recruiting an experienced, full time Safeguards Advisor who will be based in a

Central Implementation Unit (CIU) in Palikir, Pohnpei to support the World Bank portfolio. This person will provide

timely advice to the PIU Project Manager and Utility Focal Points, undertake training and capacity building and take

responsibility for implementing many of the safeguards-related tasks. The ESMF and RPF identify that where

necessary, specialist consultants will be engaged to prepare safeguards instruments, and they will be supervised by

the CIU-based Safeguards Advisor.

The capacity is adequate for the nature and scale of activities and safeguards issues to be managed under SEDAP.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies,

with an emphasis on potentially affected people.

Stakeholders include the communities of Weno, Satawan and Udot, State government agencies (Environmental

Protection Agencies) and community NGO’s such as the Chuuk Women’s Council, land owners on Weno who are

interested in leasing land to CPUC for solar investments, and people living adjacent to the utility compounds and other

sites where physical works will take place. Consultations conducted to date in the preparation of the project focused

on the State Utilities in all four states, the Chuuk Task Force (representatives of State Government agencies and the

Chuuk Women's Council), and municipal governments and local community leaders in Satawan and Udot, Chuuk State.

There is support for further energy security and for renewable energy, but there will be ongoing discussions about

willingness and ability to pay for additional connections in Chuuk, and the best sites for the location of generation and

distribution infrastructure.

The ESMP contains a Stakeholder Engagement Plan that identifies the stakeholders and provides a plan to consult with

beneficiaries and affected parties during the design phase, during technical studies and assessments, and during

installation of equipment. The key issues are to conduct robust site selection processes to avoid loss of livelihoods or

assets and to ensure voluntary land transactions, and avoid nuisances such as noise, dust and property or road access

restrictions during installations.

B. Disclosure Requirements

OPS_EA_DISCLOSURE_TABLE

Environmental Assessment/Audit/Management Plan/Other

For category A projects, date of

Date of receipt by the Bank Date of submission for disclosure distributing the Executive Summary of

the EA to the Executive Directors

09-Oct-2018 09-Oct-2018

"In country" Disclosure

Micronesia, Federated States of

25-Sep-2018

Comments

This includes an ESMF and ESMP.

OPS_RA_D ISCLOSURE_T ABLE

Resettlement Action Plan/Framework/Policy Process

Date of receipt by the Bank Date of submission for disclosure

09-Oct-2018 09-Oct-2018

"In country" Disclosure

Nov 07, 2018 Page 23 of 27

The World Bank

SUSTAINABLE ENERGY DEVELOPMENT AND ACCESS PROJECT (P165183)

Micronesia, Federated States of

25-Sep-2018

Comments

OPS_I P_DIS CLOSURE_TA BLE

Indigenous Peoples Development Plan/Framework

Date of receipt by the Bank Date of submission for disclosure

09-Oct-2018 09-Oct-2018

"In country" Disclosure

Micronesia, Federated States of

25-Sep-2018

Comments

No stand-alone instrument has been prepared. The elements of an Indigenous Peoples Plan have been included in

project design and the safeguards instruments.

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project

decision meeting)

OPS_EA_COMP_TABLE

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report?

Yes

If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?

Yes

Are the cost and the accountabilities for the EMP incorporated in the credit/loan?

Yes

OPS_ NH_COM P_TA BLE

OP/BP 4.04 - Natural Habitats

Would the project result in any significant conversion or degradation of critical natural habitats?

If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the

project include mitigation measures acceptable to the Bank?

OPS_ PCR_COM P_TA BLE

OP/BP 4.11 - Physical Cultural Resources

Does the EA include adequate measures related to cultural property?

Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?

OPS_I P_COM P_TA BLE

OP/BP 4.10 - Indigenous Peoples

Has a separate Indigenous Peoples Plan/Planning Framework (as appropriate) been prepared in consultation with

affected Indigenous Peoples?

No

OPS_IR_ COMP_TA BLE

OP/BP 4.12 - Involuntary Resettlement

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?

Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

OPS_ PDI_ COMP_TA BLE

The World Bank Policy on Disclosure of Information

Have relevant safeguard policies documents been sent to the World Bank for disclosure?

Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable

and accessible to project-affected groups and local NGOs?

Yes

All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of

measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures

related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately

reflected in the project legal documents?

Yes

The World Bank

SUSTAINABLE ENERGY DEVELOPMENT AND ACCESS PROJECT (P165183)

CONTACT POINT

World Bank

Leopold Sedogo

Senior Energy Specialist

Takayuki Doi

Sr Power Engineer

Borrower/Client/Recipient

Federated States of Micronesia

Department of Finance and Administration (DoFA)

Sinha Lawrence

Secretary

lawrence.sihna@gmail.com

Implementing Agencies

Department of Resources and Development (DR&D;)

Hubert Yamada

Assistant Secretary

huberty08@yahoo.com

Marion Henry

Secretary

marionh@fsmrd.fm

FOR MORE INFORMATION CONTACT

The World Bank

1818 H Street, NW

Washington, D.C. 20433

Telephone: (202) 473-1000

Web: http://www.worldbank.org/projects

APPROVAL

Leopold Sedogo

Task Team Leader(s):

Takayuki Doi

Approved By

Safeguards Advisor: Svend E. Jensby 09-Nov-2018

Practice Manager/Manager: Jie Tang 09-Nov-2018

Country Director: Mona Sur 13-Nov-2018