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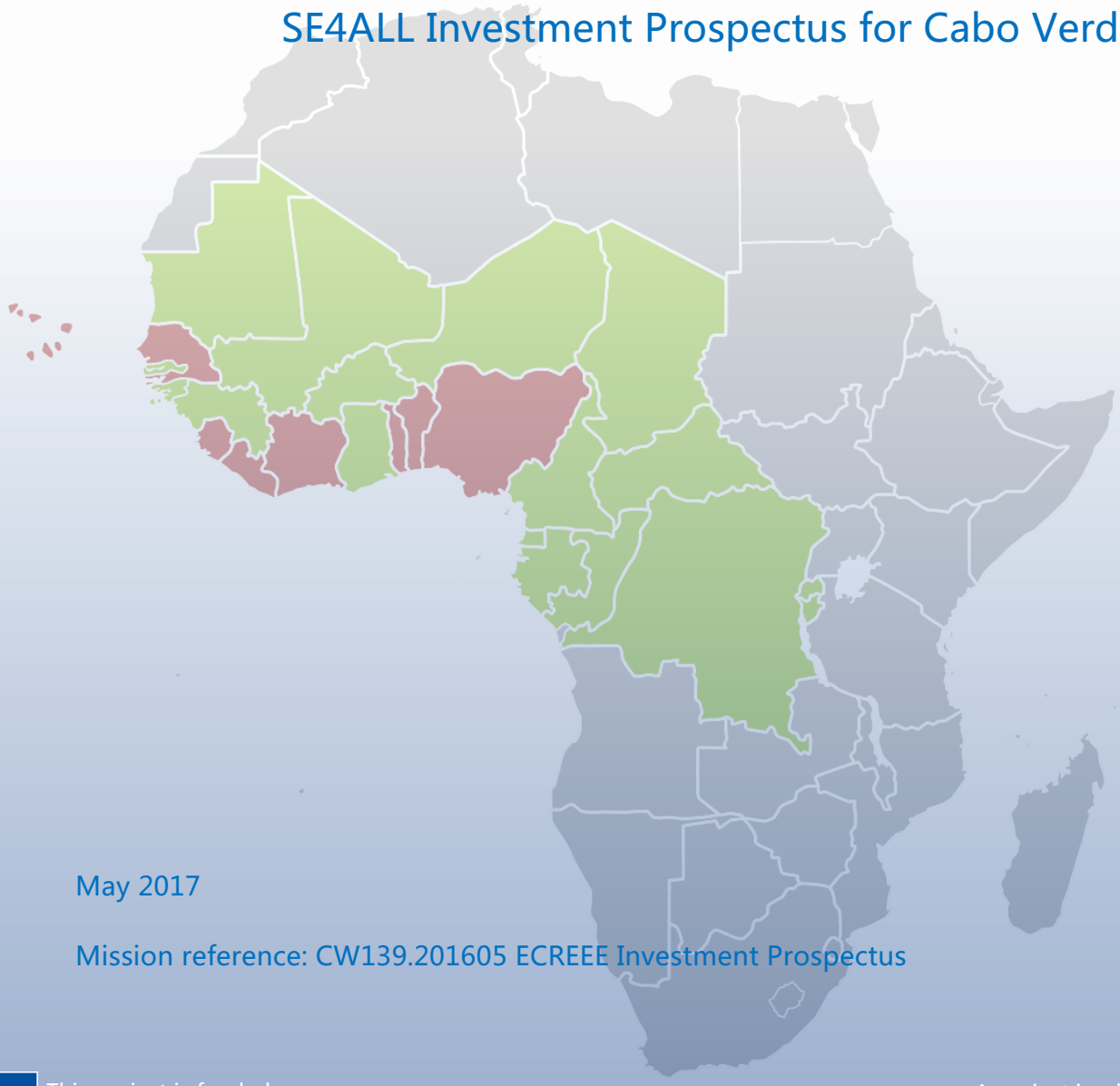
Elaboration of SE4ALL Investment Prospectuses in 8 of 15 ECOWAS member states

SE4ALL Investment Prospectus for Cabo Verde



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ECREEE has joined forces with the EU to assist member states in advancing with their Investment Prospectuses. For this reason the "**EU's Technical Assistance Facility (TAF) for the "Sustainable Energy for all" initiative"** was mobilised (Contract EuropeAid 2013/335152 – West and Central Africa) in order to assist the countries in developing their Investment Prospectuses. This is part of a wider exercise coordinated and monitored by the SE4ALL hub in Africa that is based in Abidjan.

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TAF NKE team:

- Mr. Carlos Matos Gueifão
- Mr. Francisco-Javier Ortiz de Juniga

Supervising KE

- Mr. Martin Ehrlich

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ABREVIATIONS

AA	Action Agenda
AFD	Agence Française de Développement (France)
AFDB	African Development Bank
B / Bn	Billion
CA	Contracting Authority
DEVCO	Directorate General for Development and Cooperation – EuropeAid
DFID	Department for International Development (UK)
ECOWAS	Economic Community of West African States
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency
EDF	European Development Fund
EE	Energy Efficiency
EIB	European Investment Bank
EPC	Engineering, Procurement & Construction
ESIA	Environmental and Social Impact Assessment
EU	European Union
EUD	European Union Delegation
EUR / €	Euro
FiT	Feed in Tariff
GIS	Geographical Information System
GIZ	Gesellschaft für Internationale Zusammenarbeit
GW / GWh	Giga Watts / Giga Watt hours
ha	Hectare
HPFO	High Pour Fuel Oil
HPP	Hydro Power Plant
HV	High Voltage
IBRD	International Bank for Reconstruction and Development
ICF	International Climate Fund
IEC	International Electro-technical Commission
IFC	International Finance Corporation
IFI	International Financial Institution
IP	Investment Prospectus
IPP	Independent Power Producer
JICA	Japan International Cooperation Agency
KE	Key Expert
kW / kWh	Kilo Watt / Kilo Watt hour
LRMC	Long Run Marginal Cost
LV	Low Voltage
MDG	Millennium Development Goal
MOU	Memorandum of Understanding
MV	Medium Voltage
MW / MWh	Mega Watts / Mega Watt hours
NGO	Non-Government Organization
NIP	National Indicative Programme
NKE	Non-key Expert
ODA	Official Development Assistance
OMVG	Organisation pour la mise en valeur du fleuve Gambie

OMVS	Organisation pour la mise en valeur du fleuve Sénégal
PPA	Purchase Power Agreement
PPP	Public Private Partnership
PV	Photovoltaic
RE	Renewable Energy
REA	Rural Electrification Agency
REF	Rural Electrification Fund
RrE	Rural Electrification
SE4ALL	Sustainable Energy for All
SHP	Small Hydro Power
SME	Small Medium sized Enterprise
SUNRE	Sustainable Use of Natural Resources and Energy Finance
TAF	Technical Assistance Facility
ToR	Terms of Reference
UEMOA	Union Economique et Monétaires des Etats de l'Afrique de L'Ouest
UNFCC	United Nations Framework Convention on Climate Change
USD / $	United States Dollars
WAPP	West African Power Pool
WB	World Bank

EXCHANGE RATES

Name of national currency: Escudos Cabo Verdeanos (ECV)

Exchange rate Euro: 1 EUR = 110,265 CVE (fixed rate)

Date: April 2017

1 EXECUTIVE SUMMARY

Since its independence, Cabo Verde has been steadily making progress in its national development, having a growing and transforming economy. Cabo Verde's development has been supported by appropriate changes in the country's legal and regulatory framework, which have been encouraging private sector investment in the country and boosting its growth.

Cabo Verde is one of the most developed countries in the region, as far as renewable energy is concerned. Cabo Verde's strategy focuses the energy sector as one of the pillars for national development, and the strategies currently being put into practice take into consideration the role that the energy sector plays in the whole country's progress.

Cabo Verde's recent development makes the country in the path to meet the Millennium Development Goals (MDG), having its strategies perfectly aligned with the Sustainable Energy for All (SE4ALL) goals. At the present time, the Cabo Verdean government is focused on attracting private investment to the energy sector, mainly through the development of technically and economically feasible renewable energy projects. The investment in local and renewable energy sources, taking into account the country's context, is of the utmost importance for the reduction of the national energy dependency, while also promoting access to energy services and products at competitive costs to local families and companies.

Presently, important measures are being taken in the energy sector, such as the preparation of the new energy master plan for the country. Some other relevant projects are the energy labelling and standards for equipment and appliances project, the building energy regulation and certification project, and the launch of a competitive bidding process for renewable energy, among other ongoing projects related to the energy sector.

The aforementioned competitive bidding process, which is expected to be launched soon, along with technical limitations related to the Cabo Verdean small and insular territory, hinder, at the present time, the development of renewable utility scale grid connected projects, which belong to Pipeline 1 of this Investment Prospectus.

Considering Cabo Verde's recent development, its national strategy that focuses the energy sector as one of the priorities, and the Cabo Verdean government intention to promote private investment in the country, Cabo Verde presents itself as an attractive country for investing. This is further supported by the planned and already ongoing energy projects, which are strong indicators of the country's intention to put its development strategies into practice.

The investment prospectus contains the list of the projects either submitted by public or by private entities contributing to the achievement of the objectives SE4ALL, and for which funding is required.

Depending on the project nature, the financing sought can take various forms (grants, debt, and capital). All projects are in line with the government's vision and meet criteria set in the framework of this investment prospectus. They are organised into 5 "pipelines": the first two pipelines are related to access to electricity (on-grid and off-grid); sustainable and clean cooking (biomass energy and biogas); energy efficiency; and finally projects contributing to improve the investment environment.

Projects that are expected to be implemented before 2020 and under a medium-term perspective are listed in the table below. A more complete table of the Investment Prospectus Projects is at the point 3.2 and the project fiches are at Annex 3.

This investment prospectus will evolve and will be re-published on a regular basis, in order update information on financing for projects having reached a sufficient degree of maturity and new projects will be included.

Table 0: Summary of Investment Prospectus Projects

Reference	Promoter	Project description	Total cost M €
Pipeline 1 – On-grid (Generation, Transmission and Distribution)			
CV_P1_1	University of Cabo Verde, Cabo Verde	Photovoltaic System for Palmarejo Campus	0.13
CV_P1_2	FECM, UniCV/Guilherme Mascarenhas, Cabo Verde	FECM Photovoltaics micro-grid project (School of Engineering and Marine Science)	0.05
CV_P1_3	L.E.E sàrl, Luxembourg	Resource center for sustainable waste management	18.50
CV_P1_4	Câmara Municipal de Porto Novo (Cabo verde)/ADPM (Portugal)	No Crê: Water for the sustainable development of Planalto Norte	0.52
CV_P1_5	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Photovoltaic on-grid System for Hospital Dr. Agostinho Neto	0.41
CV_P1_6	Ministério da Economia e Emprego (MEE) - Direção Nacional de Energia Indústria e Comercio (DNEIC)	Pump storage on Santiago Island	50.50
Pipeline 2 - Off-grid (Mini-Grids and Standalone Systems)			
CV_P2_1	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Decentralized Electrification of the Gongon Community	0.55
CV_P2_2	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Solar Pumping System	0.05
CV_P2_3	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Solar PV system for ice production	0.05
Pipeline 3 - Bioenergy and Cooking Projects or Programs			
CV_P3_1	Ecovisão Portugal and Ecovisão Cabo Verde	Bio&Energy – Biogas Energy Recovery	0.50
CV_P3_2	L.E.E sàrl, Luxembourg	Waste-to-value biogas plant for the sustainable valorization of organic waste	10.5-25.5
CV_P3_3	Ministério da Economia e Emprego (MEE) - Direção Nacional de Energia Indústria e Comercio (DNEIC)	University Cookstoves design research program	0.02
Pipeline 4 - Energy Efficiency			
CV_P4_1	Electra, SARL	Electricity losses reduction, energy quality improvement and energy efficiency program (component 4)	9.50

Reference	Promoter	Project description	Total cost
			M €
Pipeline 5 – Enabling Environment			
CV_P5_1	MEE – DNEIC- CABO VERDE	Public Buildings Energy Efficiency Improvement Program	0.50
CV_P5_2	MEE – DNEIC- CABO VERDE	Cooking stoves certification and Capacity Building	0.02
CV_P5_3	MEE – DNEIC- CABO VERDE	Gender Integration in the energy access in Cabo Verde	n.a.
CV_P5_4	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Electric Mobility Market Assessment	0.05

2 DESCRIPTION OF THE INVESTMENT THESIS

2.1 Country and Economic Overview

2.1.1 Geographic and demographic background and impact on the energy sector

Cabo Verde is an insular country, comprising ten small and scattered islands located in the Atlantic Ocean, about 500 km off the coast of Senegal. Cabo Verde's surface area occupies a little more than 4,000 km2, having a total population of about 500 thousand inhabitants growing at a rate of 1.3% per year, as shown in

Table 1 below.

Table 1: Country geographic and demographic background in 2014

Indicator	Value
Area (km2)	4,030
Population (million)	0.513
Population growth (%)	1.3
Share of rural population (%) (2010)	38.2
Sources: World Bank / ECOWREX	

Its geographical location off the coast of Senegal implies that Cabo Verde is part of the Sahelian arid belt, having a semi-arid, wet and dry climate, with very few rainfalls. Most of its volcanic islands are mountainous, with steep cliffs and ravines, lacking vegetation and not having noteworthy natural resources.

The Cabo Verde archipelago is spatially divided in two groups of islands:

- The Barlavento Islands, a total of six islands which include Santo Antão, São Vicente, Santa Luzia, São Nicolau, Sal and Boavista;
- The Sotavento Islands, the remaining four islands of the country, which are Maio, Santiago, Fogo and Brava.

Praia, the country's capital, is located in Santiago, the largest island both in surface area and population. Of the ten islands, all are inhabited except for Santa Luzia.

Cabo Verde is a country where subsistence was always difficult, having had several cases of struggle with droughts and famine throughout its history. Even its recent history highlights this, as without tradable natural resources and capacity to feed the population, poverty is spread out through the whole country, a problem that Cabo Verde's development plans have been targeting.

Despite the above, some of Cabo Verde's limitations have been overcome, such as the scarcity in potable water supply. In this case, most of Cabo Verde's potable water comes from desalinization plants, constituting the sole source of drinkable water in islands such as São Vicente and Sal, even though this requires large amounts of energy.

Cabo Verde is extremely dependent on the exterior, importing about 80% of its consumption. Many Cabo Verdeans have gone overseas seeking better life conditions, resulting in a diaspora that exceeds the population living inside the country. Additionally, approximately 38.2% of Cabo Verde's population live in rural areas, with the remaining 61.8% living in urban regions.

The scattering of the population due to geographical constraints related to Cabo Verde's insular nature, along with the reduced size of each island, both in surface area and in the number of inhabitants,

resulted in nine small and spread out markets. Additionally, the lack of natural resources leads to a dependency on foreign food, water and fuel, among others. Such dependency is reflected in Cabo Verde's electricity sector, which is based on diesel-fuelled generation technologies, implying high costs of electricity generation, affecting its development. For example, as presented before, Cabo Verde's water supply relies on desalinization plants that require large amounts of energy, so high electricity costs will result in high potable water costs, much needed for its uses in productive activities (agriculture, industry, etc.) and for the population itself.

2.1.2 National Economic Background

Cabo Verde has been developing steadily since its independence, having left behind the status of low-income in 2008. Its economy has had a solid growth, related to a significant economic transformation with an orientation toward services, particularly tourism.

Cabo Verde's main sources of income are foreign investment and remittances, the latter associated to the large number of Cabo Verdeans living and working abroad. Foreign Direct Investment (FDI) has been focused on real estate and tourism, and considering the relevance of the tourism sector in Cabo Verde's economy, as it represents about 20% of the national GDP, the country suffered greatly during the 2009 recession.

Despite this, between 2010 and 2013 Cabo Verde's GDP grew on average 3.6% per year, which resulted in a 2.4% growth in the GDP per capita, given that the GDP grew faster than the population. In 2014, the Cabo Verdean GDP was approximately 1.8 USD Bi, or 3,647 USD per capita, having had a 2.8% growth rate, as shown in Table 2.

Table 2: National economic background in 2014

Indicator	Value
GDP (current USD)	1,871,000,000
GDP per capita (current USD)	3,647
GDP growth (%)	2.8
Human development index (index-rank/188)	0.646 / 122
Share of population under poverty line (%) (2007)	26.6
Governance (Mo Ibrahim index) (index/100 – rank/52) (2015)	73.0 / 3
World Bank doing business index (rank/190) (2015)	126
Sources: SE4All National Focal Point / World Bank / ECOWREX	

Nonetheless, several threats to the Cabo Verdean prosperity arise. On the one hand, Cabo Verde faces structural challenges related to the high unemployment rates, which are especially significant amongst the youth, further aggravated as poverty and social inequality persist. On the other hand, the external environment has demonstrated uncertainty and risk, pressuring even more the Cabo Verdean economy. Moreover, international aid to Cabo Verde will be progressively reduced, as the country's development status renders it ineligible to concessional loans, cutting down this way one of the major sources of national inflows.

The aforementioned threats are intensified considering that Cabo Verde's public debt has increased significantly after the crisis, and despite its sustainability, the public debt might surpass the total GDP. Public debt management is therefore another challenge that further constrains public investment, and consequently economic growth.

Considering all the above, Cabo Verde needs to find ways to compete in the international markets and attract external investment through quality, efficiency, high productivity and innovation. The country needs to accelerate the process of transformation and modernization of the society, a process that should be led by a competitive private sector, capable of creating jobs and guaranteeing an inclusive distribution of the wealth generated, thus eradicating poverty.

Also present in Table 2 are the Human Development Index (HDI), the Mo Ibrahim Index and the World Bank's Doing Business rank.

The first one aims to examine the intrinsic relationship between work and human development, assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. Cabo Verde's HDI value for 2014 was 0.646, which positions the country in the 122th place out of 188, an increase of 13% since 2000, reflecting the increase in life expectancy and the mean years of schooling, as well as in the Gross National Income (GNI) per capita.

Mo Ibrahim index, on the other hand, provides a statistical assessment of the quality of governance in African countries, evaluating the delivery of public goods and services, as well as policy outcomes for each country. In 2015 Cabo Verde was ranked in 3rd place out of 54 countries, only behind Mauritius and Botswana, scoring 73 out of 100 possible points. Along with Seychelles, these countries are the only ones in the highest band of overall governance, representing the best performance in the continent.

Finally, Cabo Verde's Doing Business rank, a World Bank's report that provides objective measures of business regulations for countries throughout the world, ranked Cabo Verde in 126th place out of 189 countries, with 55.54 points out of 100 possible. "Enforcing Contracts" was the parameter where Cabo Verde achieved the highest ranking, the 47th place, having been placed in last in the "Resolving Insolvency" parameter.

2.1.3 Investment – Regulatory and Enabling Instruments

2.2 Energy Sector

2.2.1 Characterisation of the Energy Sector

Energy supply

The majority of Cabo Verde's electricity is generated using imported oil and oil derivatives, being an expensive power source that pollutes the environment with greenhouse gases. This affects the price of electricity in the country, and, considering that Cabo Verde desalinizes ocean water to produce its drinking water, using expensive power sources increases the price of water for drinking and for irrigation.

As shown in Figure 1, oil and oil products (diesel, fuel oil, Jet A1, butane and gasoline) constituted more than 80% of the total energy supplied in 2015, with renewables (including locally available firewood for cooking) accounting for the remaining 20%. This represents a decrease in the share of oil and oil products since 2010, where local energy sources only accounted for 15.3%

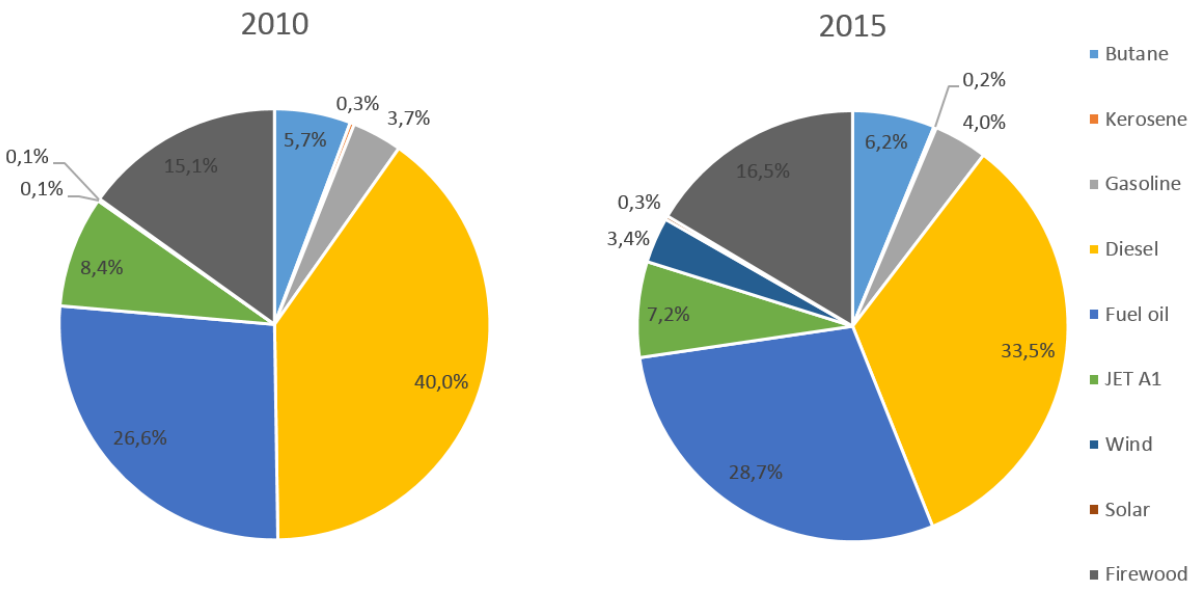


Figure 1: Energy supply sources in 2010 and 2015

In 2010 the total primary energy supply was 2,343.0 GWh, having decreased to 2,316.0 GWh in 2013 and to 2,303.0 GWh in 2015. The renewable energy penetration in the electricity generation mix drastically increased, rising from 1.1% to 19% between 2010 and 2013, resulting from the commissioning of 26 MW of wind turbines and 7.5 MW of solar PV power plants:

- In Santiago, a 9.35 MW wind farm and a 5 MWp solar PV power plant;
- In Sal, a 7.65 MW wind farm and a 2.5 MWp solar PV power plant;
- In São Vicente, a 5.95 MW wind farm;
- In Boavista, a 2.55 MW wind farm;
- In Santo Antão, a 0.5 MW wind farm.

Apart from their role in electricity generation, renewable energies in other uses, such as solar thermal panels for water heating, are still residual. The development of the energy sector also contributed to the increase of the electrification ratio more than threefold, from 25.5% in 1990 to 89% in 2014 and around 95% in 2015, while cooking gas penetration went from 40.7% to 73.0% during the same period.

Energy consumption

After peaking in 2011, energy consumption in Cabo Verde has been decreasing more than 2.4% per year until 2014, which results from the economic and financial crisis that cuts down the residential consumption, as well as the consumption from other economic sectors. Between 2014 and 2015 an increase of 0.7% of energy consumption was registered indicating that the economy is recovering and start growing again.

In 2010 the energy consumption was 1,731.0 GWh, mostly related to transport activities, responsible for approximately 48% of the total consumption, with 70% of belonging to terrestrial transportation. Of the remaining 52%, the Cabo Verdean residential sector accounted for 31% and economic activities accounted for 21%.

Firewood was the main source of energy used by the residential sector, accounting for 63% of this sector's total consumption, mostly used for cooking. The two other major energy sources used in this sector were electricity and butane, accounting for 22% and 14%. Diesel and electricity were also the main energy sources used in economic and productive activities, totalling 78% of overall consumption.

Having decreased 1.5% since 2010, the final energy consumption in 2015 was 1,706.0 GWh. Diesel and firewood are the major energy sources, accounting for more than half of the total energy used.

Nonetheless, the relative weight of diesel in the total energy consumption increased, with a 4% reduction in the final energy used in terrestrial transportation.

Figure 2 below shows the final energy consumption across every sector between 2010 and 2015, highlighting that both the relative consumption of diesel and jet A1 decreased, while the share of butane and electricity increased[1].

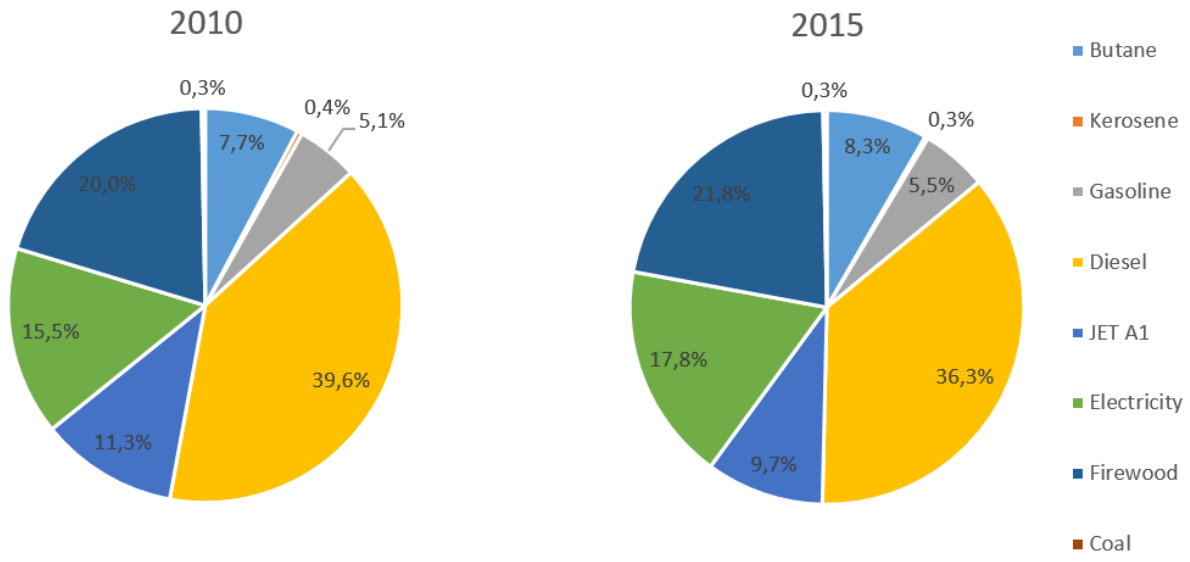


Figure 2: Final energy consumption in 2010 and 2015

Electricity generation

The installed capacity for electricity generation in Cabo Verde has been growing at a fast pace, having increased from 101.9 MW in 2010 to 156.5 MW in 2012, even though it has decreased to 197.4 MW in 2015[2]. The electricity generation has also increased, at an average 4% per year, having reached about 420.5 GWh in 2015.

The main company operating in the Cabo Verdean electricity sector is ELECTRA S.A.R.L., the public water and electricity utility. ELECTRA is in charge of the largest generation power plants and of the distribution network, except in Boavista Island, where the public-private company AEB (Águas e Electricidade de Boavista) has the sub-concession of the public service and in Sal Island where the company APP (Águas de Ponta Preta) operates as an Independent Power Producer (IPP). APP ensures on Sal Island the supply of water and electricity to some touristic resorts (the rest of the island is supplied by ELECTRA).

Presently, the biggest producer of wind energy in Cabo Verde is Cabeólica S.A., a public-private partnership (PPP) operating since 2009 in Santiago, São Vicente, Sal and Boavista. Additionally, ELECTRIC WIND, a private company, has also developed and currently operates a wind farm in Santo Antão Island, operating as an Independent Power Producer (IPP)

Finally, ENACOL and VIVO Energy are the main entities in the Cabo Verdean fuel market, the backbone of electricity generation. This market is considerably small, and it is further divided in 9 smaller markets. Even though 90% of the total sales occur in São Vicente, Sal, Boavista and Santiago, the remaining 5 islands also need to be supplied, being so at significantly higher costs. As such, the costs of electricity in Cabo Verde are high, having increased in the recent past. As of October 2016, the electricity tariffs in

[1] MEE/DNEIC (2017)
[2] MEE/DNEIC (2017)

Cabo Verde range between 22.6 USD cents/kWh and 32 USD cents/kWh, depending on the type of consumer. The highest value is for a residential client whose consumption exceeds 60 kWh per month.

The electricity sector has been the target of several reforms, with large investments in energy generation, aimed to increase both the installed capacity and the renewable penetration. Renewable energies are becoming more and more important in Cabo Verde. Although wind turbines were initially used for water pumping, having the first wind farms arrived later in the 80s, only in 2011 an enabling environment adjusted to renewable energy technologies was created, with the adoption of the Decree-law nº 1/2011. With wind farms and solar PV power plants being directly connected to the grid, renewable penetration increased to 20% in 2013, resulting in almost 80 GWh of electricity generated by renewable energy in 2013. Along with the replacement of diesel by fuel oil, the increase in renewable generation has resulted in a slightly higher efficiency.

Electricity consumption

After having grown with a rate above 8% for several years, final electricity consumption in Cabo Verde has grown less than 5% per year since 2010, with the total consumption increasing from 268.0 GWh in 2010 to 304.0 GWh in 2015. Electricity consumption is mostly driven by economic activities and by residential consumers, which accounted for 48% and 43% of the consumption in 2010. The lack of installed capacity, particularly in Santiago and Sal, has hindered electricity consumption, although it is expected that the investment in generation plants, together with the growth of economic activities, will lead to an increase in the final electricity used.

Table 4 below summarizes the background of the Cabo Verdean energy sector.

Table 3: Energy sector background in 2015

Indicator	Value
Primary energy supply (Mtoe)	0.1980
Primary biomass energy (Mtoe)	0.0326
Primary renewable energy (Mtoe)	0.0073
Primary fossil energy (Mtoe)	0.1581
Final energy total (Mtoe)	0.1467
Final modern energy BLEN (Mtoe)	0.0324
Final electricity demand (TWh)	0.304
Sources: World Bank / TAF Country Fiche / ECOWREX	

2.2.2 Policy, Institutional and Regulatory Framework

Both the Cabo Verdean energy sector and electricity sector have changed significantly since the early 90s. Firstly, in 2005, the National Strategy for Domestic Energies (*Estratégia Nacional para as Energias Domésticas*) was released, functioning as the main instrument leading the policies that impact on the domestic energy sector, as well as providing framework for the access of modern forms of energy taking into account the country's context, characterized by a fragile ecosystem and few biomass sources. This document's main goal was the improvement of the quality of life of Cabo Verdean families, meeting their energy needs for cooking in a sustainable manner, while minimizing the negative impacts in their health and in the environment.

Later, in 2008, a new institutional framework was created, as the national government shared its vision of the energy sector in a document named "*Documento de Política Energética de Cabo Verde*", stating the need to build a safe, efficient and sustainable energy sector that was not dependent on fossil fuels. The institutional framework strengthened the investment in renewable energies and allowed the diversification of the electricity generation subsector, by encouraging the participation of independent

producers, such as Cabeólica and ELECTRIC WIND. This document also comprised several goals, including a 50% renewable penetration in electricity generation by 2020 and at least one 100% renewable island.

Three years later, in 2011, the investment in renewable energy sources was stimulated with the publishing of Decree-law nº 1/2011, through the creation of a licensing regime adapted to renewable energies. Not only this provided a framework for technical and safety issues, it also established a set of fiscal and customs-related incentives. Moreover, micro-generation was targeted with specific benefits so as to promote the development of such systems. This Decree-law was complemented with the publishing of Decree-law nº 18/2014, which adjusted some measures to further promote investment, as well as to clarify the different roles of stakeholders in the licensing and grid-connection processes.

Also in 2011, the Master Plan for Renewable Energies (PDER - Plano Diretor de Energias Renováveis) was developed and approved, providing guidance so as to achieve the set targets for the country. The Sectoral Strategic Plan for Renewable Energies (PESER - Plano Estratégico Setorial para as Energias Renováveis) was approved later, by the end of 2012, analysing and identifying areas with high renewable potential, which were reserved for the installation of renewable generation technologies.

Finally, related to Cabo Verde's commitments in the Economic Community of West African States (ECOWAS) region, a triad of public policy documents were prepared and published in 2015: the Sustainable Energy for All Action Agenda (SE4All AA), the National Renewable Energies Action Plan (NREAP) and the National Energy Efficiency Action Plan (NEEAP). These documents are intrinsically connected, being a part of the same strategy and reflecting the synergy in public policy instruments in order to optimize the use of resources. As the elaboration of these documents was coordinated and supported by the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE), they provide a vision coherent with regional strategies and initiatives.

Table 4Table 5 below summarizes the institutional framework of the Cabo Verdean energy sector.

Table 4: Institutional framework of the energy sector

Role	Institution
Electricity/Energy regulator	Agência de Regulação Económica (ARE)
Operators in the electricity sector	ELECTRA/ Águas e Energia de Boavista (AEB) / Águas de Ponta Preta (APP)
Institution in charge of rural electrification	Ministério da Economia e Emprego (MEE) / Direcção Nacional de Energia, Industria e Comércio (DNEIC)
Institution in charge of renewable energy	MEE/DNEIC
Institution in charge of energy efficiency	MEE/DNEIC
Source:National SE4 National Focal Point / EU TAF Expert team / ECREEE	

It is also important to mention that the Cabo Verdean energy sector is regulated by the Economic Regulation Authority (ARE – Agência de Regulação Económica) since 2004. Its mission is to ensure an adequate provision of services to consumers and the sustainability of the operators in the energy, water and collective transport systems sectors, being responsible for their regulation.

2.3 Energy Sector Trajectory

2.3.1 Electricity Sector

Cabo Verde's development is leading to an economy more and more based on the tertiary sector, i.e. services, with a small and mostly urban population. Thus, the electricity sector has grown considerably

in the recent past, and it is expected that electricity demand grows at a rate slightly higher than the economic growth, estimated to be approximately 6% until 2030, also taking into account the on-going investments in additional installed capacity. This results in more than twofold increase in electricity demand, from approximately 300 GWh in 2013 to almost 800 GWh in 2030.

Furthermore, the energy sector is considered to be one of the key-sectors for the country's progress, and one of the goals set for this sector's development is the universal access to electricity throughout the country, supported by a strong bet in technically and economically feasible renewable electricity generation projects. That bet is defined in the basis for energy policy of the New Program of Governance.

2.3.2 Large-scale Generation and Transmission

2.3.2.1 Renewable Energy Use

Cabo Verde's electricity sector development plans expect to satisfy the large majority on electricity demands with renewable energy technologies. More specifically, measures in the New Program of Governance include the promotion of large-scale wind energy to the maximum penetration rate and the investment in solar PV for small- and medium-scale projects, as these technologies are mature and economically competitive. Despite this, it is necessary to consider that there are no technical conditions to install more medium and large scale on-grid renewable capacity in the major islands, except for Santiago where a medium scale grid connected RE Project could be implemented in the short/medium term period.

Meanwhile, other potentially feasible energy sources could be developed in the long run, such as biodiesel, geothermal and MSW power plants. Cabo Verde's development plans aim for the diversification of the selected technologies, including energy storage technologies, needed for renewable penetrations above 30%. Energy storage technologies may include pumped storage power plants, bioenergy resources, synthetic fuel, batteries and flywheels, among others.

The transformation of a fuel-based generation system into a system based on intermittent renewable technologies has to take into account each island technical restrictions and particular demand profiles.

Finally, even though the objective is to connect every rural community to the grid, where such connections are not technically and/or economically feasible, rural communities should be supplied exclusively by renewable electricity generation sources in mini-grid schemes, with scattered households using renewable energy-based home systems. Micro-generation incentives for grid-connected systems will be restricted to self-consumption, avoiding power injection in the grid[3].

2.3.2.2 Urban Distribution

Cabo Verde has made significant progresses relatively to its population's electricity access, as the access to electricity increased from approximately 20% to almost 100% in the last 40 years. Currently, electrification is already universal in urban areas, and the existing plans predict that nationwide access to electricity will be achieved in 2017. Thus, concerning Cabo Verde's urban electricity distribution, the objective is to keep up with the growth of urban population and increasing electricity demand, so as to maintain the universal electrification rate.

2.3.3 Rural Electrification

Rural electrification has been a priority in Cabo Verde's development plans. Recent grid expansion, along with the increasing urbanization, has resulted in a rural electrification ratio increase from 80.8%

[3] MEE/DNEIC (2017)

in 2010 to more than 92.0% in 2013, and it is expected that access to electricity will be universal by 2017.

Cabo Verde plans to achieve a 100% electrification rate are supported by the creation of mini-grids and isolated systems based on renewable energies, in addition to several electrification and grid expansion plans. This is intended to support and stimulate the creation of income-generation activities, as well as to provide a better quality of life to rural communities. Possible off-grid projects were already identified in Santiago and Santo Antão islands.

The most recent census estimates that approximately 3,000 households have not yet access to electricity. This access will be provided through grid connection, whenever feasible. If not, mini-grids and isolated systems based on renewable generation technologies will be developed, for rural communities and remote households, respectively. It is important to state that the mapping of communities without access to electricity not only allows their quantification, but is also intended to assess the specific characteristics of each one. Current plans estimate that, by 2030, 98.5% of the population will be connected to the grid, with the remaining 1.5% being connected to mini-grids or isolated systems.

2.3.4 Petroleum Products / LPG

In the recent past, apart from oil consumption, fuel consumption has been fairly constant. Even though it grew slightly from 2010 to 2011, in the following years the total energy consumption from fuel sources decreased. Diesel is the most used fuel in Cabo Verde, having been responsible for 61.2% of the total fuel consumption in 2010 and 60.5% in 2015.

It is expected that the growth in diesel and gasoline consumption will remain stagnant until 2020, later increasing to an average yearly growth of 1.5% and 2.0%, respectively, between 2020 and 2030. On the other hand, jet A1 consumption is predicted to increase at a yearly rate of 3.5% until 2020 and then at 6.0% per year until 2030[4].

Finally, butane consumption has remained almost unchanged, in part due to the end of the subsidies that existed until the early 00's, along with the economic crisis, cultural habits and other factors. The evolution in butane consumption is intimately connected to the use of biomass for cooking, discussed in the following section.

Considering the recent evolution in energy and fuel consumption, Cabo Verde's SE4AAP has developed a base scenario for the estimation of the evolution in the energy mix. In the same document, a target for fuel consumption is defined, aiming for a 10% reduction in fuel consumption relatively to the baseline scenario until 2030. The reduction in fuel consumption, particularly with the replacement of fuel-based generation with renewable energy power plants, greatly contributes to the Cabo Verdean energy efficiency potential.

2.3.5 Biomass and Traditional Energy Usage

As mentioned in Section 2.3.1, Cabo Verde's energy sector development plans are supported by three axes. The second axis ambitions to eradicate three-rock stoves until 2020, through the testing and distribution of improved cook stoves, increasing butane penetration to rates higher than 90%.

The above goals involve approximately 30,000 households throughout the country, mostly situated in rural areas. The use of gas as a replacement of wood for cooking is the main alternative considered,

[4] MEE/DNEIC (2017)

although it is necessary to take into account technical, social, cultural and economic factors associated to such change.

Presently, access to safe and modern cooking is not widespread. Gas penetration has remained still since the early 90's, around 66% nationwide, even though in rural areas the value is lower than 36%. Despite butane being physically available, using firewood or gas for cooking is not a choice, as financial availability is the major factor constraining the use of gas for most rural families. Consequently, a part of the population relies on wood, in a country where biomass resources are scarce, a situation that is aggravated by the low efficiency of the three-rock cook stoves[5].

Given the above, Cabo Verde plans to increase the access to safe and modern cooking fuels to 91.3% in 2030, decreasing this way the use of the traditional biomass for cooking. This objective is aligned with the objective to reduce about 82% biomass consumption from 2013 to 2030, representing a use of biomass for cooking of 2% and 10% for urban and rural areas, respectively. This second goal aims to reduce biomass use to sustainable levels, not only through the universalization of modern cooking fuels, but also with the improvement of the currently used cooking technologies that reduce specific energy consumption to approximately 50%.

Increasing the access to safe and modern cooking fuels also impacts the health and well-being of Cabo Verde's population, and is considered an instrument against poverty and gender inequality. However, both the eradication of the three-rock cook stoves and the replacement of cooking fuels imply changes in the traditional and cultural practices, while the possibility of choosing between wood and gas requires an increase in the population's income.

Finally, other solutions may be developed, such as the use of biomass digesters to produce biogas. Despite the estimated low potential of these resources in Cabo Verde, their production and use may benefit rural communities and provide them with a local income source.

2.3.6 Energy Efficiency and Demand Side Management

Apart from a few initiatives, mostly awareness campaigns related to light bulbs, energy efficiency in Cabo Verde was a neglected area until the development of SE4ALL Action Plans and more particularly NEEAP. Moreover, despite the high electricity cost in Cabo Verde, the main decision factors when purchasing an equipment are its cost and its availability, with its efficiency not being considered relevant, as one of the already identified needs is an eco-labelling system. This problem also applies to the generation and distribution of electricity, with the lack of optimization of the generation system and the only recent concern in distribution losses, both technical and non-technical.

Considering the above, the third axis Cabo Verde's energy sector development plans, is the awareness of efficient practices in energy production and consumption, aiming for a 20% reduction in the final energy demand by 2030. Other specific goals related to this axis are the already mentioned target of reducing fuel consumption by 10% and the target of reducing losses in electricity distribution to 8%.

Thus, the NEEAP arises as the first structuring element for energy efficiency measures in Cabo Verde, including several projects already on-going, such as initiatives for improvements in electricity distribution, as well as other planned projects, such as a project that aims to promote energy efficiency in buildings and equipment.

The NEEAP describes the strategy for the promotion of energy efficiency in four main axes of intervention, related to energy efficiency in electricity distribution: in public and private buildings; in equipment and household appliances; and in intensive consumers such as hotels. While the first axis

[5] MEE/DNEIC (2017)

includes public financing through the Cabo Verdean utility, Electra, the other three axes rely on the creation of an enabling environment.

Among others, NEEAP intends to reduce the final energy intensity, defined as the ratio between the final energy consumption and the GDP, to 0.7 kWh/€ in 2030, half of the value this parameter had in 2013.

Furthermore, it is important that the energy efficient goals are seen together with the renewable energy goals and other measures. For instance, the demand should be managed in order to be adjusted to the intermittency associated to renewable energy sources. All these energy efficiency goals require raising awareness and promoting sustainable and efficient behaviours, changing the way families and companies use electricity.

Included in the list of behaviours that need changing are the high energy losses related to electricity fraud and theft and losses due to failures in the billing system, or non-technical losses, constituting a large share of the total distribution losses that amount to 27% (2015). Both the technical and non-technical losses are a barrier for the electricity sector efficiency, and they need to be properly assessed and dealt with.

Concerning the efficiency in electricity distribution, the target is to reduce total distribution losses to 8% until 2020, through the complete elimination of non-technical losses. This requires a fast and structured technical and social intervention, and is estimated to save between 110 and 186 GWh of electricity per year from 2020 to 2030.

2.4 SE4ALL Initiative

2.4.1 Overview

The SE4All Country Action Reference Document (CARD) foresees the following steps for the implementation of SE4All Country Actions in Cabo Verde:

1. A Declaration of Partnership through which the Cabo Verdean government expresses its desire to participate in the SE4All initiative;
2. A Rapid Assessment/Gap Analysis, which describes the status quo regarding energy in the Cabo Verdean development context, providing the political, economic, social, and environmental background for the subsequent drafting of strategic plans to promote SE4All in the country;
3. A Country Action Agenda, which is a strategy-driven and holistic document that addresses the issues and gaps identified in the respective Rapid Assessment/Gap Analysis by outlining and prioritizing various courses of action and demonstrates how the three goals of SE4All can be achieved;
4. Investment Prospectus, which provides an approach to operationalizing the previously mentioned Country Action Agenda, in each specific sector or subsector, by identifying and developing a set of implementable programs and projects, including their investment requirements, that can be presented to potential private and public investors.

The Africa Hub, in consultation with SE4All partners, developed several guidelines to assist in the development of the Action Agenda and Investment Prospectus, including an Action Agenda template, a guide for assessing the quality of the documents produced, stakeholder consultation guidelines and a concept note on the IP.

The ECOWAS Energy Ministers have appointed ECREEE to act as the SE4ALL Focal Point in the ECOWAS region, and to take up the development and implementation of the SE4ALL initiative in the ECOWAS region.

2.4.2 SE4ALL – 2030 Vision and Objectives

The Cabo Verdean government has defined targets according to the SE4All objectives, related to the electricity access rates, modern cooking fuels penetration, renewables penetration in electricity generation and energy efficiency rates, as described in Table 5 below.

Table 5: SE4All vision and objectives up to 2030

	2015	2020	2030
Target access rates to electricity (%)			
National	98%	100%	100%
Target access rate to butane as modern cooking fuel (%)			
National	71.7%	76.6%	91.3%
Target share of renewable in the generation capacity mix (%)			
Renewable	-	No target defined [6]	
Fossil fuel	-		
Target energy efficiency rates over baseline scenario (%) – reduction in:			
Final energy consumption	-	-	20%
Fossil fuel consumption	-	-	10%
Electricity consumption	-	-	20%
Total grid losses	-	-	8%
Source:National SE4Focal Point / EU TAF Expert team / ECREEE			

2.4.3 AA Roll-out and Implementation Actions

In order to promote the sustainable development of the country, the Cabo Verdean government has defined a set of actions under the SE4All initiative. Such actions are described in the SE4All Action Agenda, and highlight the government's commitment to improve the existing conditions in the country.

Table 6: Action Agenda foreseen implementation actions

No.	Action description
1 - Action Agenda for increasing electricity access	
1.1	Mapping of families without access to electricity
1.2	Analysis and development of electrification alternatives
1.3	Grid connection, if feasible
1.4	Implementation of renewable mini-grids
1.5	Development and implementation of stand-alone electricity systems for isolated households

[6] INDC (Intended National Determined Contribution) for 2025 (35%) / Existing Masterplan 2020 target: 50% / New masterplan with targets until 2040 under discussion

No.	Action description
2 - Action Agenda for increasing access to modern cooking fuel	
2.1	Creation of a multi-disciplinary follow-up team
2.2	Follow-up and assessment of each community
2.3	Analysis of solutions for the eradication of three-rock stoves with the participation of the targeted communities, promoting the use of butane
2.4	Definition of financing models
2.5	Implementation of solutions
2.6	Follow-up and assessment
3 - Action Agenda for increasing the share of renewable energy	
3.1	**Previous studies**
3.1.1	Analysis of the institutional and legal framework
3.1.2	Detailed mapping of the renewable potential
3.1.3	In-depth study of the transmission and distribution grids operating conditions and of electricity losses
3.1.4	Market study of different alternatives
3.1.5	Impact study of renewable penetration in the fuel sector
3.1.6	Impact study of renewable penetration in the State's income
3.1.7	Impact study of renewable penetration in the trade balance
3.1.8	Strategic environmental analysis
3.1.9	Detailed studies to achieve the goal of 30-35% of renewable penetration in every island
3.1.10	Detailed studies to achieve the goal of 50% of renewable penetration in every island
3.1.11	Detailed studies to achieve the goal of 100% of renewable penetration in every island
3.2	**Enabling environment**
3.2.1	Legislation update
3.2.2	Legislation regulation
3.2.3	Energy sector restructuring
3.2.4	Definition and clarification of institutional accountability; creation of the Insular Energy Agency
3.2.5	Identification and removal of institutional barriers
3.2.6	Definition of standards and renewable equipment certification
3.2.7	Classification of technical parameters
3.2.8	Definition of bidding processes for IPPs
3.2.9	Definition of criteria and requirements for IPP contracts
3.2.10	Regulation of tariffs for IPPs and for microgeneration
3.3	**Development and execution of energy storage demonstration projects**
3.3.1	Analysis of available alternatives
3.3.2	Elaboration of pilot projects
3.3.3	Implementation of pilot projects
3.3.4	Project for a 100% renewable island
3.3.5	Tracking, monitoring and evaluation of pilot projects
3.4	**Development and execution of energy storage demonstration projects**

No.	Action description
3.4.1	Development of a simple process for the presentation of renewable energy and energy efficiency projects
3.4.2	Promotion and certification of Energy Services Companies
3.4.3	Program for microgeneration in public buildings
3.4.4	Program for the universalization of access to renewable energy
3.4.5	Creation of an energy storage market
3.4.6	Creation of a solar thermal market
3.4.7	Creation of an internal market for the production of solar thermal collectors
3.4.8	Development of a financing system for microgeneration
3.4.9	Development of a business and financing model for stand-alone systems
3.1.10	Auction process for IPPs
3.4.11	Raising awareness campaigns concerning the benefits of renewable energy
3.4.12	Creation of a renewable energy cluster coordination institution for the promotion of companies in the Cabo Verdean energy sector
3.5	**Biomass and bioenergy initiatives**
3.5.1	Testing of biodiesel solutions
3.5.2	Testing of bioenergy solutions based on organic residues
3.5.3	Improvement of the biomass chain-of-supply
4 - Action Agenda for increasing energy efficiency	
3.5	**Enabling environment**
4.1.1	Legislation update
4.1.2	Legislation regulation
4.1.3	Regulation of energy-intensive consumers
4.1.4	Development of energy-efficient building norms
4.1.5	Building energy regulation and certification
4.1.6	Energy labelling and standards for equipment and appliances
4.1.7	Regulation of appliances' import and certification
4.1.8	Encouragement mechanisms for the removal of inefficient equipment and appliances
4.1.9	Creation of a log for equipment and appliances
4.1.10	Regulation of acclimatization equipment installation
4.1.11	Regulation of industrial equipment installation
4.1.12	Creation of the Insular Energy Agency
4.2	**Development of the energy efficiency market**
4.2.1	Regulation of Energy Services Companies
4.2.2	Development of a financing system for energy efficiency
4.2.3	Raising awareness campaigns concerning the benefits of energy efficiency
Source:National SE4Focal Point / EU TAF Expert team / ECREEE	

2.4.4 Stakeholders, Programmes and SE4ALL Objectives.

The National Directorate of Energy, Industry and Commerce (DNEIC) is the Cabo Verdean entity responsible to coordinate, manage and follow-up all actions related to SE4All Initiative.

Even though the SE4All Action Agenda was already developed and published, not all the actions indicated in the previous chapter have been started or carried out yet but some initiatives and projects are being executed currently as indicated in the table below.

Table 7: Stakeholders, programmes and time frame

Stakeholder	Programme	Time frame
MEE/DNEIC	Legal, regulatory and administrative framework development to procure new renewable energy capacity	2015-2017
MEE/DNEIC	Long Term Agreement (LTA) for the provision of Professional Consultancy Services for removing barriers for Energy Efficiency in Cabo Verde Appliances Sector	2017-2019
MEE/DNEIC	Long Term Agreement (LTA) for the provision of Professional Consultancy Services for removing barriers for Energy Efficiency in Cabo Verde Building Sector	2017-2019
ELECTRA	Losses Reduction and Energy Quality improvement Program – Component 3	2016-2017
MEE/DNEIC	Pumped Storage – Economic and Financial simulations to define the public-private-partnership strategy	2016-2017
MEE/DNEIC	Cabo Verde Energy Masterplan 2040	2017
MEE/DNEIC	Grid Code for the Power Sector of Cabo Verde	2016-2017
MEE/DNEIC	Survey for Renewable Energy introduction and grid stabilization in the Republic of Cabo Verde	2016
MEE/DNEIC	Distributed Solar Energy Study - Market Assessment Study	2017
MEE/DNEIC	Buildings and Appliances Energy Efficiency Project	2015-2019
MEE/DNEIC	Renewable Energy Sector Support Program (LuxDev)	2016-2020
MEE/DNEIC	Reforming and operationalizing the framework for distributed generation for renewable energy in Cape Verde	2016
MEE/DNEIC	Toolbox for renewable energy tariff design in West African countries	2015-2016
MEE/DNEIC	Dec-Law Project to establish the regulatory framework for intensive energy users	2016
MEE/DNEIC	Dec-Law Project to establish the regulatory framework for ESCO's	2016
MEE/DNEIC	Blueprint for the elaboration of standalone micro-grid systems powered by renewables	2016-2017
Source: National SE4Focal Point / EU TAF Expert team / ECREEE		

2.5 IP Framework

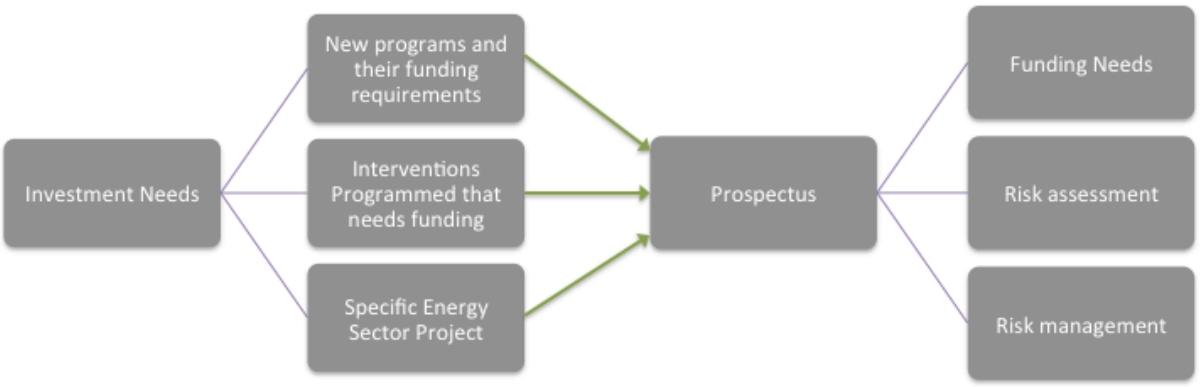
2.5.1 Linkage between AA and IP

Cabo Verde developed and approved the SE4All Action Agenda, the National Renewable Energy Action Plan and the National Energy Efficiency Action Plan. Those documents defines the national strategy regarding the energy sector, following a sustainable path and aligned with the SE4All goals.

Following these previous documents, the IP consists on the development of a pipeline of projects to be presented to potential investors, such as public and private financing institutions.

A schematic overview of the Investment Prospectus development process is provided in figure 3 below.

Figure 3: Development process of the Investment Prospectus



2.5.2 IP Portfolio Management

Considering the IP's objectives, stated in the previous section, the Cabo Verdean government has been developing and implementing several measures to promote a positive framework for potential investors.

Presently, the government is prepared to support stakeholders in the development of projects in Cabo Verde, having a dedicated team to do so, falling under the competence of the DNEIC (National Directorate of Energy, Industry and Commerce).

2.5.3 Implementation Arrangements

It is also important to state that the Cabo Verde Investment Prospectus is a living document that will be updated regularly, with the inclusion of new projects in the pipeline in order to continuously meet the objectives of the Country and SE4ALL Initiative.

The Cabo Verdean government is responsible for the management of the pipeline, and will ensure the support for the already identified projects. As such, the IP is considered to be a process, which will continue so as to support Cabo Verde in its sustainable growth.

2.5.4 Monitoring and Evaluation

Cabo Verdean government is engaged and will closely monitor and evaluate the IP process and Projects implementation.

Amongst other responsibilities and tasks, DNEIC (National Directorate of Energy, Industry and Commerce) will keep track of the achievement of SE4All goals, and monitor the development to check its accordance with those goals.

Furthermore, this includes the support to the development of the project pipeline, as well as the continuous addition of upcoming relevant projects.

2.6 SE4All – Enabling Environment

2.6.1 On-grid (Generation, Transmission, and Distribution)

The Government of Cabo Verde has already implemented some enabling environment measures and initiatives that reinforce its commitment in achieving the proposed SE4All goals, having others currently ongoing.

Enabling environment measures already taken relatively to the Cabo Verdean institutional framework concerning on-grid generation, transmission and distribution are listed in Table 8, while other ongoing projects and initiatives concerning the same subject are presented in Table 9.

Table 8: On-grid (Generation, Transmission, and Distribution) - Institutional framework

Indicator / Criteria	Value – Assessment - Statement
Grid connected RE electricity generation	
National strategic document	Cabo Verde 50% Renewable Energy Roadmap 2010-2020 (2010) Renewable Energy National Action Plan (2015) Energy Masterplan 2040 (ongoing)
Renewable Energy Assessment and Mapping	Cabo Verde Renewable Energy Atlas (2010)
Renewables Investment Plan	Cabo Verde Renewables Investment Plan 2010-2020 (2010)
Grid connected rural electrification & densification	
Rural electrification master plan	N/A
Regulation regarding local network connection	N/A
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE	

Table 9: On-grid (Generation, Transmission, and Distribution) - Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Pump-storage Santiago Island / Cabo Verde - Economic and financial simulations to define the PPP strategy	MEE/DNEIC	2016-2017
Legal, regulatory and administrative framework development to procure new renewable energy capacity (2015-2017)	MEE/DNEIC	2015-2017
Cabo Verde Energy Masterplan 2040	MEE/DNEIC	2017
Survey for Renewable Energy introduction and grid stabilization in the Republic of Cabo Verde	MEE/DNEIC	2016
Grid Code for the Power Sector of Cabo Verde	MEE/DNEIC	2016-2017
Distributed Solar Energy Study - Market Assessment Study	MEE/DNEIC	2017
Renewable Energy Sector Support Program	MEE/DNEIC	2016-2020
Toolbox for renewable energy tariff design in West African countries	MEE/DNEIC	2016-2017

Reforming and operationalizing the framework for distributed generation for renewable energy in Cape Verde	MEE/DNEIC	2016
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE		

2.6.2 Off-grid (Mini-grids and Standalone Systems)

Table 10 and Table 11 below indicate the relevant context concerning the off-grid institutional framework and off-grid ongoing projects and initiatives, respectively.

Table 10: Off-grid (Mini-grids and Standalone Systems) - Institutional framework

Indicator / Criteria	Value – Assessment - Statement
National strategy document	N/A
Support to private initiatives	N/A
Specification of norms and best practices	N/A
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE	

Table 11: Off-grid (Mini-grids and Standalone Systems) - Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Existing micro-grids energy selling and management models strengthening in Portuguese speaking countries in CEDEAO	MEE/DNEIC	2015-2017
Blueprint for the elaboration of standalone micro-grid systems powered by renewables	MEE/DNEIC	2016-2017
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE		

2.6.3 Bioenergy and Efficient Cook-stoves

Similarly to what was presented in the above sections, Table 12 and table 13 below present the institutional framework and the ongoing projects and initiatives concerning bioenergy and efficient cook-stoves in Cabo Verde.

Table 12: Bioenergy and Improve Cook-stoves - Institutional framework

Indicator / Criteria	Value – Assessment - Statement
National strategy	National Strategy for Domestic Energies
Institutional support structure	Energy and Employment Ministry
Promotion programmes	N/A
Incentive programmes	N/A
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE	

Table 13: Bioenergy and Improve Cook-stoves - Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Cookstoves Production Training under WACCA's capacity-building activity.	MEE/DNEIC	2017
Biogas community system installation for 17 families at Santa Cruz	MEE/DNEIC	2016-2017
Development and implementation of a national action plan on cooking energy under WACCA's policy development framework	MEE/DNEIC	2016-2017
Awareness Campaign	MEE/DNEIC	2016-2017
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE		

2.6.4 Energy Efficiency

Table 14 and Table 15 below contain the relevant indicators about the Cabo Verdean energy efficiency institutional framework and relevant ongoing projects and initiatives, respectively.

Table 14: Energy Efficiency - Institutional framework of the energy sector

Indicator / Criteria	Value – Assessment - Statement
National energy efficiency strategy	Energy Efficiency National Action Plan (2015)
Energy efficiency agency	N/A
EE promotion programmes	Buildings and Appliances Energy Efficiency Program
EE investment incentives	N/A
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE	

Table 15: Energy Efficiency - List of Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Long Term Agreement (LTA) for the provision of Professional Consultancy Services for removing barriers for Energy Efficiency in Cabo Verde Appliances Sector	MEE/DNEIC	2015-2019
Long Term Agreement (LTA) for the provision of Professional Consultancy Services for removing barriers for Energy Efficiency in Cabo Verde Building Sector	MEE/DNEIC	2015-2019
Losses Reduction and Energy Quality improvement Program	ELECTRA	2014-2017
Dec-Law Project to establish the regulatory framework for ESCO's	MEE/DNEIC	2016-2017
Dec-Law Project to establish the regulatory framework for intensive energy users	MEE/DNEIC	2016-2017
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE		

2.6.5 Enabling Environment

Finally, the enabling environment institutional framework is presented in Table 16, while the ongoing enabling environment projects and initiatives are listed in Table 17.

Table 16: Enabling Environment - Institutional framework

Indicator / Criteria	Value – Assessment - Statement
Legal framework	Renewables Legal Framework Dec-Law 01/2011 (2010)
Renewables Procurement Framework	Legal, regulatory and administrative framework development to procure new renewable energy capacity (2017)
Promotion of private investment	N/A
Enabling structures for local initiatives	N/A
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE	

Table 17: Enabling Environment - Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Renewable Energy Sector Support Program (LuxDev)	MEE/DNEIC	2016-2020
Source: SE4All National Focal Point / EU TAF Expert team / ECREEE		

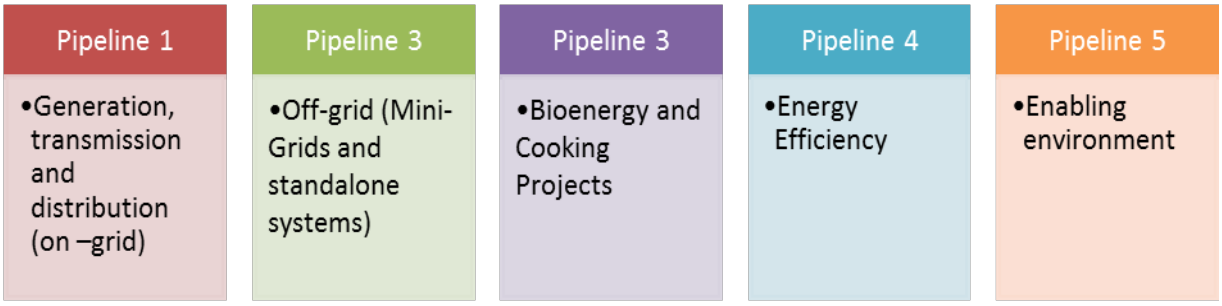
3 PIPELINE OF SE4ALL PROJECTS

3.1 IP Pipeline

3.1.1 Time Horizon

3.1.2 SE4ALL IP Pipelines

Figure 4: Five ECOWAS SE4All IP Pipelines



Source: ECREEE IP Flyer – Annex 1

***Table 18:* Investment Prospectus – ECOWAS SE4All IP Pipelines**

No,	Pipeline	Definition
1	On-Grid (Generation, Transmission and Distribution)	TBD. It should be noted, however, that there is some fluidity between Pipelines 1 and 2, inasmuch as mini-grids are being built to grid specifications to accommodate eventual connection to the grid. Likewise, the issues to be addressed by the 4 distribution companies will not differ significantly from the mini-grids.
2	Off-grid (Mini-Grids and Standalone Systems)	
3	Bioenergy and Cooking Projects or programs	
4	Energy Efficiency	
5	Enabling Environment	
Source:National SE4Focal Point / EU TAF Expert team / ECREEE		

3.1.3 Eligibility Criteria

3.1.3.1 General IP Criteria

- Project alignment with AA: contribution to the SE4ALL objectives in term of increased access to electricity, increased access to sustainable modern cooking fuel, use of renewable energy, increased energy efficiency
- Alignment with relevant national plans (Master Plan, etc,)
- Probability of implementation
- Sustainability
- Scalability/Easy replication
- Project timeline
- Social inclusion (Number of Beneficiaries, gender approach, poverty alleviation…),

3.1.3.2 Specific Country IP Criteria

- P1
  - Respect of the Energy Master plan and the main orientations of the country
  - Precision on the process : established with the DGE and under the Technical Comity's supervision
- P2
  - Respect the Energy Master Plan and the main orientations of the country
  - No exclusion of the future means of production linked to the grid
  - Management model : private operator (electricity code)
  - Autonomous Individual Systems: penetration capacity and diffusion rate / simple replication
- P3
  - Proved penetration capacity and diffusion rates
  - Demonstration existence
  - Valorisation of the residue not the agricultural resource
  - No competition with food use
- P4
  - 20% of gains relative to the reference scenario (« baseline ») during the investment period
  - Part of a pragmatic approach for tertiary buildings (large size)
- P5
  - Alignment to the priorities of the Agenda Action SE4ALL, Reglementations, ODD7

3.2 PIPELINE OF SE4ALL PROJECTS

The following table lists the projects included in this Investment Prospectus. The respective Project Fiches are given in Annex 3 (section 4.1).

Table 19: Investment Prospectus Projects

Reference	Promoter	Project description	Total cost	Financing needs		Type of financing required	Time horizon
			M €	M €	%		
Pipeline 1 – On-grid (Generation, Transmission and Distribution)							
CV_P1_1	University of Cabo Verde, Cabo Verde	Photovoltaic System for Palmarejo Campus	0.13	0.10	75%	Public	Short term
CV_P1_2	FECM, UniCV/Guilherme Mascarenhas, Cabo Verde	FECM Photovoltaics micro-grid project (School of Engineering and Marine Science)	0.05	0.05	85.5%	Public	Short term
CV_P1_3	L.E.E sàrl, Luxembourg	Resource center for sustainable waste management	18.50	18.5	100%	Private	Short term
CV_P1_4	Câmara Municipal de Porto Novo (Cabo verde)/ADPM (Portugal)	No Crê: Water for the sustainable development of Planalto Norte	0.52	0.18	35.6%	Public	Short term
CV_P1_5	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Photovoltaic on-grid System for Hospital Dr. Agostinho Neto	0.41	0.31	75.7%	Public	Short term
CV_P1_6	Ministério da Economia e Emprego (MEE) - Direção Nacional de Energia Indústria e Comercio (DNEIC)	Pump storage on Santiago Island	50.50	50.50	100%	PPP	Medium term
Pipeline 2 - Off-grid (Mini-Grids and Standalone Systems)							
CV_P2_1	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Decentralized Electrification of the Gongon Community	0.55	0.55	100%	Public	Short term

Reference	Promoter	Project description	Total cost	Financing needs		Type of financing required	Time horizon
			M €	M €	%		
CV_P2_2	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Solar Pumping System	0.05	0.05	94%	Public	Short term
CV_P2_3	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Solar PV system for ice production	0.05	0.05	100%	Public	Short term
Pipeline 3 - Bioenergy and Cooking Projects or Programmes							
CV_P3_1	Ecovisão Portugal and Ecovisão Cabo Verde	Bio&Energy – Biogas Energy Recovery	0.50	0.50	100%	Private	Short term
CV_P3_2	L.E.E sàrl, Luxembourg	Waste-to-value biogas plant for the sustainable valorization of organic waste	10.5-25.5	10.5-25.5	100%	Private	Short term
CV_P3_3	Ministério da Economia e Emprego (MEE) - Direção Nacional de Energia Indústria e Comercio (DNEIC)	University Cookstoves design research program	0.02	0.02	100%	Public	Short term
Pipeline 4 - Energy Efficiency							
CV_P4_1	Electra, SARL	Electricity losses reduction, energy quality improvement and energy efficiency program (component 4)	9.5	5.5	57.9%	Public	Short term
Pipeline 5 - Enabling Environment							
CV_P5_1	MEE – DNEIC- CABO VERDE	Public Buildings Energy Efficiency Improvement Program	0.50	0.50	100%	Public	Short term
CV_P5_2	MEE – DNEIC- CABO VERDE	Cooking stoves certification and Capacity Building	0.02	0.02	100%	Public	Short term

Reference	Promoter	Project description	Total cost	Financing needs		Type of financing required	Time horizon
			M €	M €	%		
CV_P5_3	MEE – DNEIC- CABO VERDE	Gender Integration in the energy access in Cabo Verde	n.a.	n.a.		Public	Short term
CV_P5_4	Centre of Renewable Energy and Industrial Maintenance (CERMI), E.P.E.	Electric Mobility Market Assessment	0.05	0.05	100%	Public	Short term

4 ANNEXES

4.1 Annex 1 - Documents Consulted

EU TAF / MWH. (2016). *Cabo Verde Country Fiche.*

Gesto Energia / MTIDE Cabo Verde. (2011). *Cabo Verde 50% Renewable.*

MTIDE Cabo Verde. (2015). *Agenda de Ação para a Energia Sustentável para Todos – Cabo Verde.*

MTIDE Cabo Verde. (2015). *Plano Nacional de Ação para a Eficiência Energética – Cabo Verde.*

MTIDE Cabo Verde. (2015). *Plano Nacional de Ação para as Energias Renováveis – Cabo Verde.*

The World Bank Group. (2016). *Doing Business 2016.*

4.2 Annex 2 : Schedule of meetings – List of persons met

Cape Verde IP Task Force members:

- Adalcides Adriano
- Ariel Assunção
- Eduarda Radwan
- Helder Lima
- Jaqueline Pina
- Miriam Veracruz
- Rito Évora
- Samira Andrade

Entity	Date	Persons Met
ECREEE	19/09/2016	Jansénio Delgado Nicola Bugatti
NFP	20/09/2016	Anildo Costa
EU delegation	20/09/2016	Guilherme Bragança
Cabeólica	20/09/2016	Antão Fortes
Electra SARL	21/09/2016	Manuel Silva
UNICV	21/09/2016	Antunio Barbosa Guilherme Marcarenhas
BeCV - Câmara de Comércio do Norte de Cabo Verde/ North Chamber of Commerce	21/09/2016	Ariana Fortes
ELECTRIC	21/09/2016	Daniel Graça
UNICV	22/09/2016	Dra. Judite Nascimento
Direção Nacional do Plano	22/09/2016	Dra. Carla Cruz

ARE	22/09/2016	Karine Monteiro
Câmara de Comércio de Sotavento	22/09/2016	Dr. José Luis Neves.
CERMI, E.P.E. – Centro de Energias Renováveis e Manutenção Industrial	22/09/2016	Pedro Semedo
NFP and ECREEE	22/09/2016	Anildo Costa Jansénio Delgado Nicola Bugatti
ECREEE	23/09/2016	Jansénio Delgado Nicola Bugatti
ECREEE	04/04/2017	Jansénio Delgado Nicola Bugatti
EU delegation	04/04/2017	Guilherme Bragança
NFP and IP Task Force	04/04/2017	Óscar Borges Mario Oliveira IP Task Force Jansénio Delgado Nicola Bugatti
IP Task Force	04/04/2017	IP Task Force Jansénio Delgado Nicola Bugatti
IP Task Force	05/04/2017	IP Task Force
ECREEE	05/04/2017	Jansénio Delgado Nicola Bugatti
IP Task Force	06/04/2017	IP Task Force
CERMI	06/04/2017	Luis Teixeira Edson Mendes
NFP/IP Task Force and ECREEE	06/04/2017	NFP/IP Task Force Jansénio Delgado Nicola Bugatti
EU Delegation	06/04/2017	Guilherme Bragança

4.3 Annexe 3 : Project Fiches

In a separate document.