



MINISTÉRIO DA ECONOMIA E EMPREGO
D.G.E. – DIRECÇÃO GERAL DA ENERGIA



COOPERAÇÃO



CABO VERDE - LUXEMBURGO

Renewable Energy Support Program

Luxembourg in Cabo Verde Renewable Energy Sector

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Workshop on Renewable Energy Development in Macaronesia and West Africa

Cooperation in the Renewable Energy Sector

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Luxembourg has a long history of successful Development Cooperation with Cabo Verde (partner country since 1993)

The 3rd ICP (Indicative Cooperation Program) between the 2 countries, which initiated in 2011, placed particular attention in competence development to serve for RE and EE sector with construction of CERMI.

The support to RE sector development in Cabo Verde came with the 4th ICP, where Renewable Energy is the 3rd axis of intervention.

Reinforced Sectorial Dialog

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A Joint Declaration was signed in September 2014 by Cabo Verde, the EU, Austria, Luxembourg, Portugal and Spain to reinforce sectorial dialog for the energy sector cooperation in light of the RE transition.

The aim of the Joint Declaration is to help Cabo Verde improve donor support coordination to achieve the goals defined by the Sustainable Energy for All program, such as:

- ✓ increasing the renewable energy percentage in the energy mix (reduce carbon footprint)
- ✓ achieve reliable and cost effective access for the population to electricity and modern energy services with significant gains to the competitiveness of Cabo Verde's economy
- ✓ Poverty reduction

Economic Relations

Expanding economic relations between Cabo Verde and Luxembourg in the RE sector as of 2013

- Luxembourg business delegation missions to Cabo Verde, with representatives of the Luxembourg National Agency For Research and Innovation, Luxinnovation, which is part of the Ecoinnovation Cluster.

New Projects Identified

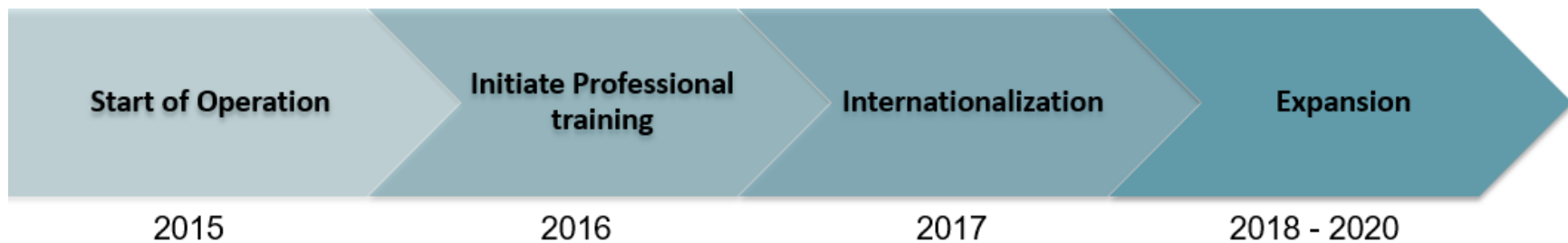
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During the missions new potential demo projects and areas for investigation were identified with the support of LuxInnovation, and financed by Luxembourg:

- ✓ Waste to Energy Study– Executed by L.E.E. SÀRL
 - The assignment includes the technical and economic feasibility study for a resource center in Santiago Island, valorizing the solid municipal waste by recycling and by generating clean energy (electricity, bio-methane) and high-quality fertilizer from the organic material.
- ✓ 2 Demo Projects prepared by LuxInnovation
 - Micro Grid Demo Project for Small Villages (50-80 house holds)
 - Renewable Energy Supply for Fishing Villages

ICP III 2011-2015

- ✓ Construction of CERMI in 2014 (vision: PALOP, ECOWAS)
 - Support to the National Employment and Vocational Training Program
 - A big step towards capacity building of RE and EE skilled workforce in CVE, and projecting to PALOP and ECOWAS.
- ✓ CERMI BP in 2016



PIC III 2011-2015

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CERMI's BP is framed with the following vision:

- ✓ ensure its economic viability and sustainability through development of its line of strategic activity "Professional Training".
- ✓ strengthen its opposition as a regional center of competence in the field of EE , RE and industrial maintenance (IM) and become a recognized test lab for certification of RE equipment.
- ✓ develop new framework 2017-2020 which includes two main line of activities:
 - training and certification for installers/contractors
 - Business incubator and R&D&I (RE and EE).

There are ongoing discussion on a partnership with the Luxembourg Center of Competence to help accelerate this important development

PIC III 2011-2015

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Luxembourg is also working with Agua Brava to improve EE in water supply in Fogo.

- ✓ Energy audit and proposal for improving energy efficiency in Agua Brava completed.
- ✓ proposal for solar water pumping completed.

The work with Agua Brava will continue in the new ICP 2016-2020

PIC III 2011-2015

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In October 2013 Luxembourg Financed the study *Cape Verde 100% Renewable: A Roadmap to 2020* conducted by Ifas, a German institute

- ✓ Emphasized and confirmed energy transition potential, but comes a cost
- ✓ Underlines the need to avoid one-size fit all approach (9 islands = 9 different systems, with different needs)
- ✓ It elected EE as one of key elements to reduce investments in production capacity (Renewables and conventional generation)

ICP IV 2016-2020

The 4th ICP opens the door to renewable energy as a new axis of intervention in development cooperation between CVE and Luxembourg.

Three new Programs are launched in the scope of the new ICP:

CVE/081 - Employment and Employability Support Program

CVE/082 - Water and Sanitation Support Program

CVE/083 - Renewable Energy Support Program

CVE/081 and Energy PIC IV: 2016-2020

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CVE/081 Employment and Employability Support Program

- ✓ Provides continued support to CERMI and the implementation of its BP
- ✓ Explore opportunity for capacity development of workforce that can serve hotels in RE/EE/IM (energy-tourism nexus)

Final stage of Formulation. Implementation phase starts in Q3 2016

CVE/082 and Energy PIC IV: 2016-2020

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CVE/082 Water and Sanitation Support Program

- ✓ Some activities will focus on the shared responsibility and cross-sector views in energy-water nexus
 - activities geared towards improving EE measures for water supply systems (Agua Brava)
 - Offsetting fossil flues (FF) with cleaner technologies for water pumping

Final stage of Formulation. Implementation phase starts in Q3 2016

CVE/083 PIC IV: 2016-2020

CVE/083 is the first Renewable Energy Support Program

CVE/083 Objectives PIC IV: 2016-2020

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- ✓ Promote universal access of the population of Cape Verde to reliable and modern energy services (clean energy for poverty reduction);
- ✓ Improve the degree of self-sufficiency and energy security
- ✓ Reduce the emission of greenhouse gases (gCO₂e/kWh) by increasing the share of renewables in the energy mix;
- ✓ Strengthen international cooperation to promote research and application of technologies adapted to the specific context of Cape Verde

Formulation of the 4 year intervention in the RE sector started in February 2016 and will end in December 2016

CVE/083 PIC IV: 2016-2020

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Renewable Energy Sector Mapping

Initial Diagnostic Study (IDS) of the RE sector in Cabo Verde was conducted by Luxembourg Development Cooperation in April 2015

A number of barriers were identified, which can be grouped as such: (i) institutional and regulatory capacity barriers, (ii) financing barriers, (iii) technical barriers, (iv) RE sector information and perception barriers.

This study also indicated a favorable context for the RE energy transition in Cabo Verde.

- ▣ The opportunity: high real cost for electricity
- ✓ EE Market opportunity (at the grid and consumer level)
- ✓ RE market opportunity given the natural solar and wind conditions
- ✓ Opportunity for sector reform offsetting the use of FF with RE (leverage FF subsidies, cost reduction of cleaner generation technologies)

CVE/083 PIC IV: 2016-2020

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According to CVE National Plans for RE and EE, the energy transition will leverage and stimulate private sector investment to reduce strains on public finances and grow the economy.

Through the national action plans, the government of Cabo Verde presents itself as promoter, facilitator and regulator of the intended RE transition.

Thus, the RE transition will require interventions to strengthen the market across a broad spectrum of policy and regulation, implicate strong political leadership/commitment, and call for long term integrated planed vision for the energy sector for continued technological advancements to tackle specific issues related to small power systems with high share of renewables (frequency + voltage control).

CVE/083 Formulation

The vision and the needs underlined in the national plans for RE and EE, helped draw the strategic focus for CVE/083 on:

- ✓ capacity building of DGE and ARE to lead, regulate and govern the RE sector.
- ✓ Mitigation of RE financing barriers

Specific detailed studies were identified with DGE to prepare CVE/083 intervention program, taking into account the ongoing work of other TFP which are also actively supporting the RE transition in CVE, working on policy reform, technical definitions for the grid and energy sector master plan.

CVE/083 Formulation Detailed Study

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CONSULTANCY SERVICES FOR THE DEVELOPMENT OF PROPOSALS TO IMPROVE RENEWABLE ENERGY GOVERNANCE IN CABO VERDE AND ENHANCE THE OVERALL ENVIRONMENT TO PROMOTE PRIVATE INVESTMENT IN THE NATIONAL RENEWABLE ENERGY MARKET

Objectives

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The energy transition will call for an objective sector governance, transparent and supportive regulation/processes, skilled institutions, and access to financing to attract private investors (national and international), in order to institute confidence and capitalize on the opportunities in Cabo Verde's RE market.

CVE/083 is launching this study to prepare a proposal to develop the vision, resources (financial and human) and instruments for an enabling environment for renewable energy in Cabo Verde, based on 3 axes:

- ✓ Good Governance
- ✓ Sustainable Financing
- ✓ Mitigated Lending Risk

Focus on DGE and ARE capacity building

CVE/083 Formulation Detailed Study

CONSULTANCY SERVICES TO DEVELOP SUSTAINABLE RENEWABLE ENERGY
MICROGRID BLUEPRINT AND MICROGRID PROJECTS FOR UNELECTRIFIED
REMOTE RURAL COMMUNITIES IN SANTIAGO ISLAND, CABO VERDE

Objectives

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Support Cabo Verde on its path to sustainable universal access to electricity (INDC 100% by 2017) using renewable energy technologies, and capacity building of DGE for future deployments of RE Microgrid projects through competitive concession award which are transparent and objective.

This study will also bridge the potential sustainable development opportunity for the unelectrified communities.

Results will be an input for Luxinnovation demo

CVE/083 Formulation Detailed Study

CABO VERDE RENEWABLE ENERGY TRANSITION SUSTAINABILITY STUDY
(SOCIAL-ECONOMIC, GENDER AND ENVIRONMENTAL PROTECTION)

Objectives

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This study will comment on and analyze the current framework for Social-Economic, Gender and Environmental Protection aspects of the RE transition and provide recommendations/strategies which should be taken into account for sustainable development of RE in CVE

It will assess a broader view on RE transition sustainability topic, and exploit a shared concept principle with other sectors: shared vision, shared resources, shared responsibilities, shared rights and risks, and shared costs and values in CVE context for higher efficiency and equity among sectors, for the benefit of the civil society.

CVE/083 El Hierro Mission

The El Hierro wind/hydro hybrid system comes about as flagship project for small island systems wishing to decarbonize the electric sector by maximizing the use of RE.

The project is part of the El Hierro 100% Renewable vision.

CVE/083 El Hierro Mission

The CVE/083 Program Formulation included this field mission to El Hierro and ITC, to further explore the natural shared interest in RE that connects Cabo Verde and the Canary Island and learn about their practical experience in the design, implementation, operation and dispatching of the wind/hydro hybrid solution.

This mission had a special interest in the financing modality of the El Hierro project, its sustainability and technical approach used to address the challenges that surrounds small remote island systems with high percentage of intermittent and fluctuating RE resources in the energy mix.

CVE/083 El Hierro Mission

Some factors for consideration in the El Hierro experience:

- Public finance made the project bankable
- Shared concept principle with other sectors (water, tourism, agriculture and transport) is part of El Hierro 100% sustainability proposition
- Collaboration and knowledge transfer (lessons learned) between Cabo Verde, GdV and ITC should be further exploited given the shares interests, challenges and island specificity
- There is the opportunity to explore a possible meteorological and climate modeling collaboration with ITC on providing regional and island specific climate and wind projections, based on IPCC protocols.

Thank you

MVC