CABO VERDE
THE MID - ATLANTIC GATEWAY TO THE WORLD'S ECONOMY

Conferência Germano-Cabo-Verdiana

Smart & Green Energy Solutions para um Desenvolvimento Urbano Sustentável em Cabo Verde

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DNICE-DSE

PEDS The Strategic Plan for Sustainable Development

SDG CABO VERDE

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Direção Nacional de Indústria, Comércio e Energia

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The National Program for Energy Sustainability (NPES)

The long-term strategy is to accomplish the transition to an energy sector that is:

- secure,
- efficient,
- sustainable, without reliance on fossil fuels and,
- to insure universal access and energy security.

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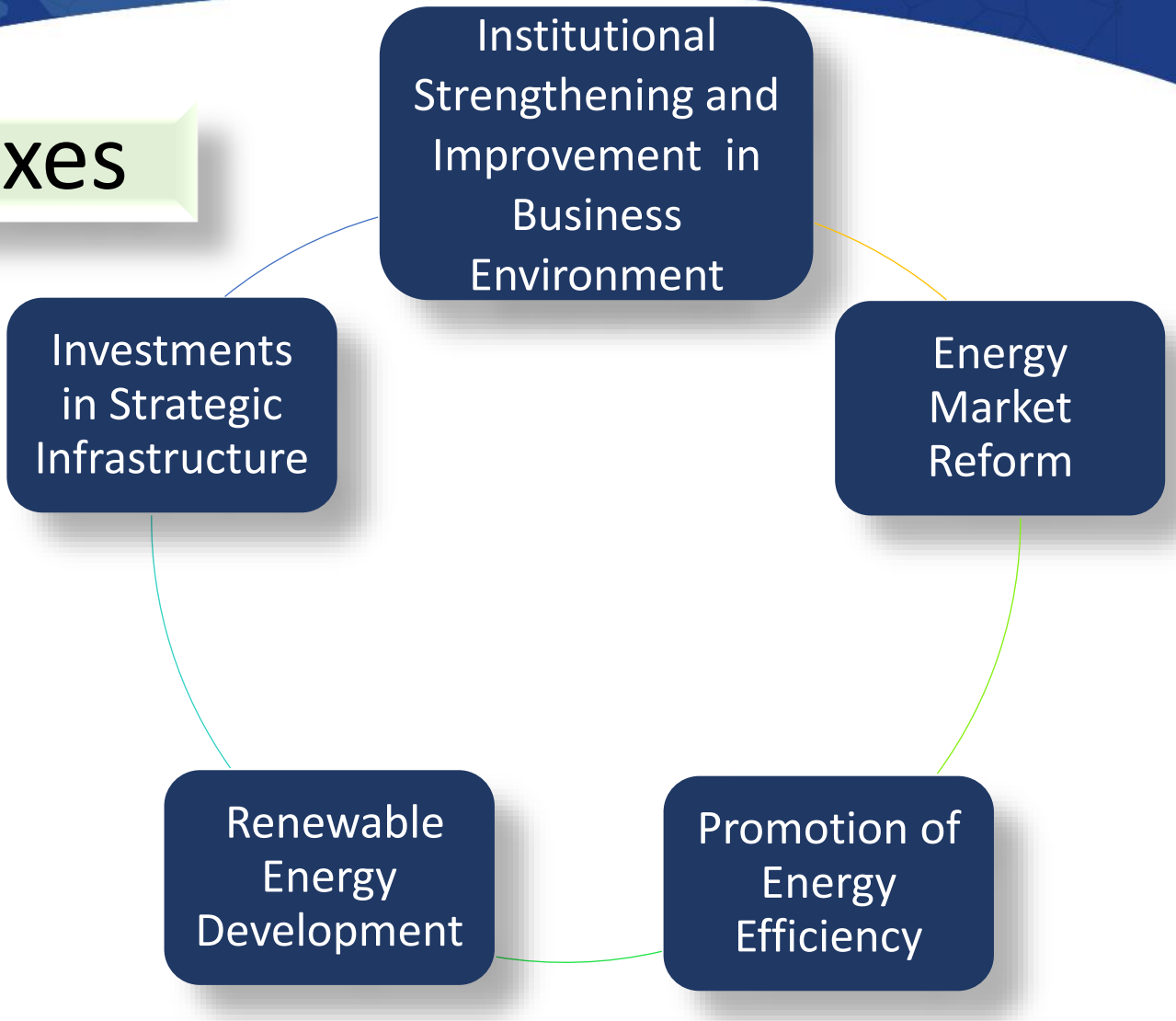
NPES main Axes



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Key Legislations Approved

- Electric Mobility
- CEEE (Energy Efficiency Code for Buildings)
- SNEREE (National System of Labeling and Energy Efficiency Requirements)
- Green Bonds
- Roteiro Smart-Grid
- Intensive Consumers and ESCOs

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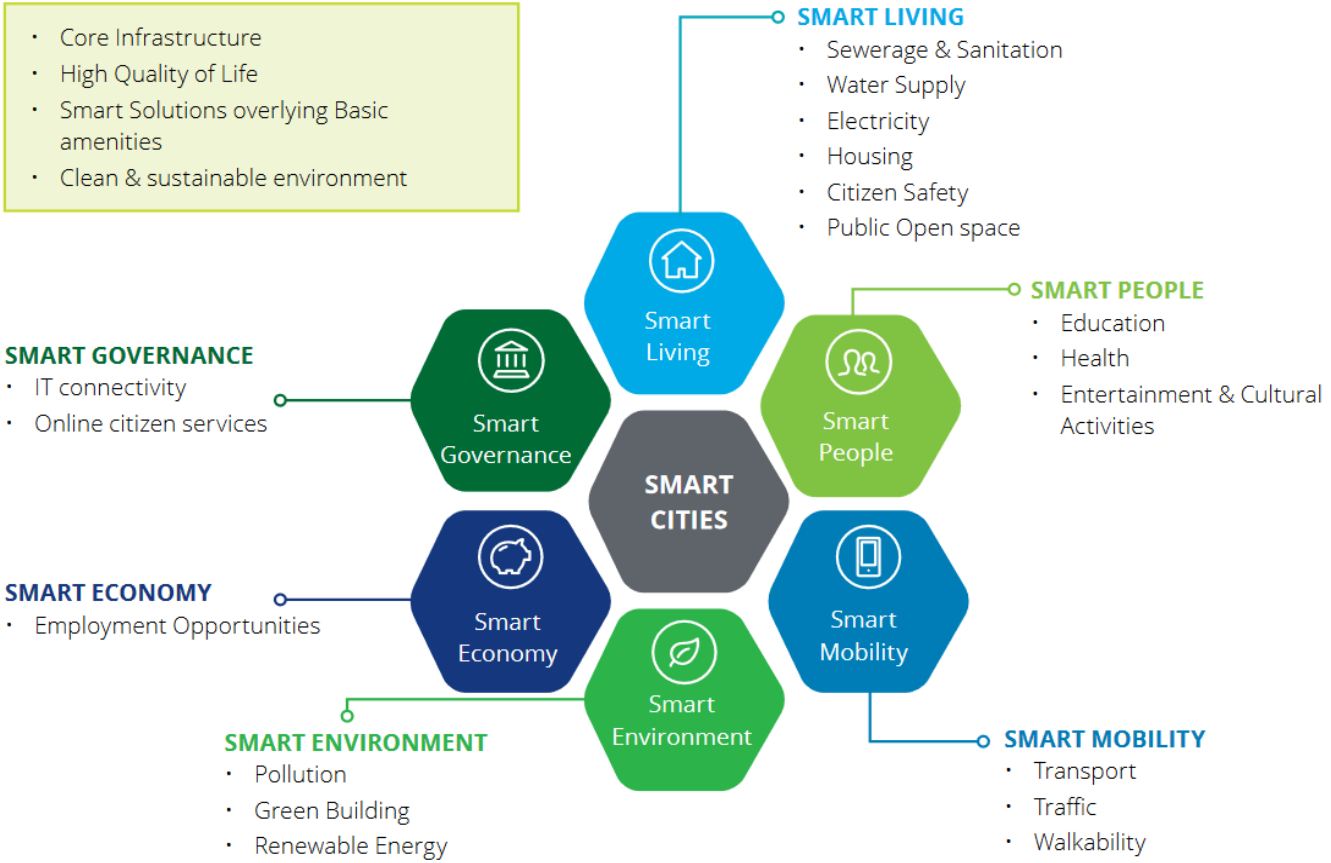
Smart Cities Concept

- Core Infrastructure
- High Quality of Life
- Smart Solutions overlying Basic amenities
- Clean & sustainable environment



Source: Deloitte Analysis

1. https://smartcitiescouncil.com/smart-cities-information-center/definitions-and-overviews

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Smart Grid Road Map Main Objetives

1. Increase electricity share from renewables
- To reduce energy dependency on fossil fuels

2. Guarantee stability and security
- Power system enhancement in presence of higher renewable sources

3. Reduce losses
- Losses have relevant values in the country

4. Generation & operation cost reduction
- Leading to lower cost of electricity for customers

5. Facilitate the integration of Distributed Energy Resources
- Customer empowerment and microgrids

6. Increase the efficiency of the electricity consumption
- Demand increase management and consumption pattern collection

7. Improve the quality of supply of customers
- To reduce outages

8. ICT and Cyber Security Enhancing
- Guarantee the adequacy of communication infrastructure and its security

9. E-Mobility and transport electrification
- Develop public infrastructure for charging management of electrical vehicles

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CV Smart Grid Road Map - priority projects

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Vison

"A digital, distributed and reliable grid for efficient and secure operation of power system and energy market, supporting sustainable energy transition and customer empowerment."

Objective	Short term (2021)	Medium term (2025)	Long term (2030)
1. Renewable share increase	Advanced **RES forecasting** procedure revision & SCADA implementing **ESS management module** implementation in SCADA/EMS		
2. System stability	**TOU tariff** revision and implementation (data collection and billing) **Market revision** for RES and ESS participation in Anciliary services	Voltage VAR optimisation	
3. Loss reduction	**Smart Meter (AMI)** Deoployment Unified **Billing system** and customer account migration	**Data Analytic** Fraud Pevention	**Advanced Outage Management System**
4. Gen. & Op. cost reduction	**DR** program implementation	**DSM** program implementation	**Advance Asset Management** System Implementation
5. On-grid DER Management	Auto-generation Connection Procedure (**Tech. Assessment**) **DER module** in SCADA/DMS	Demand and Generation **Aggregation** Platform	
6. Energy efficiency	Demand Management program (**DR and DSM**) Customer campaing &Web **Portal**		**Smart Building** Control System
7. Quality of supply	**Protection Selectivity** Study Unified **quality index** procedure, measure and register (using SCADA and AMI data)		
8. ICT and CS Enhancing	**IT dept.** re-structuring	**Security policy** development and monitoring **Communication** requirement assessment and assignation	
9. E-Mobility		Public **EV** charging **infrastrature** Implementation G2V module implementation	

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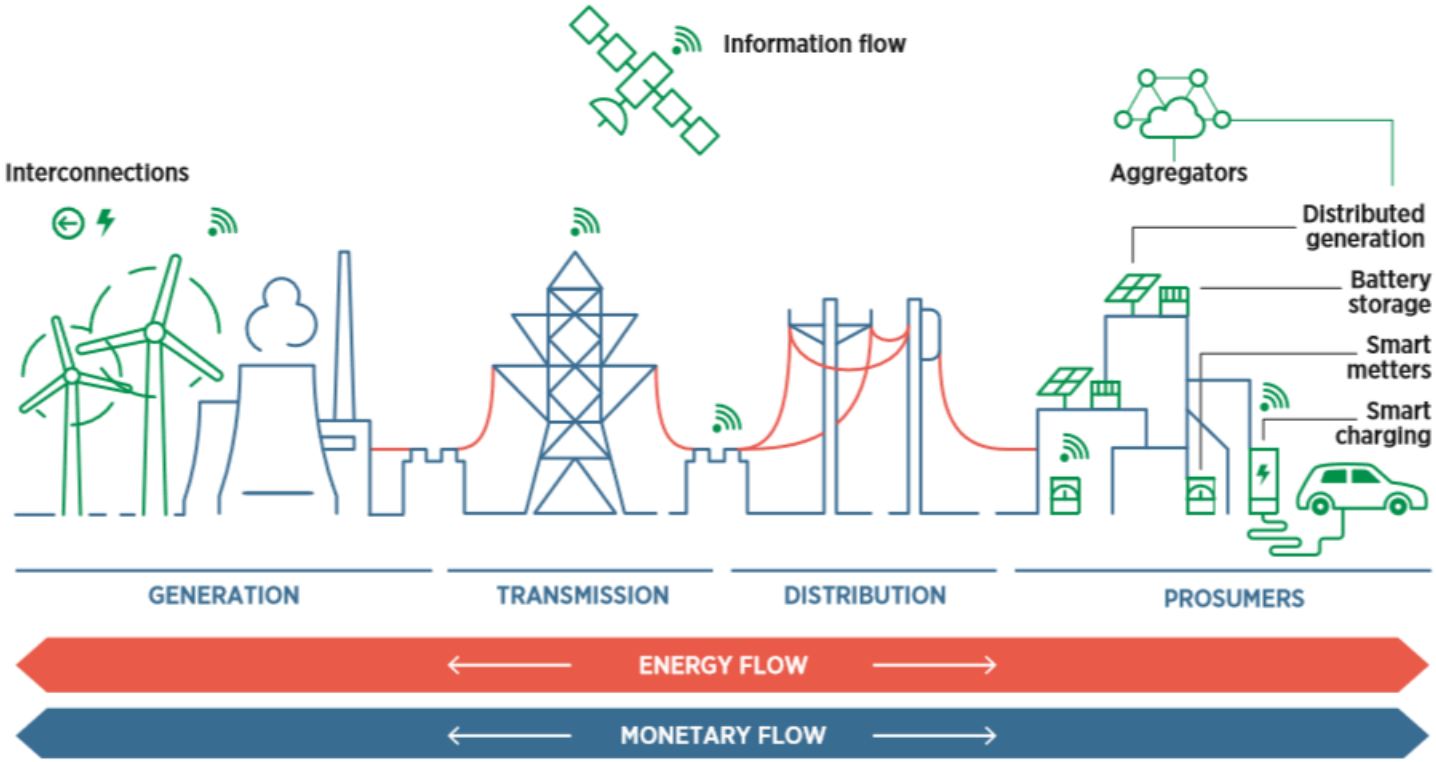
NEW PARADIGM OF THE ENERGY SUPPLY CHAIN



Fonte :IRENA

Sustainability Concept for Brava Island

- The Sustainable Brava Island Project will create the conditions for the development of Brava in line with the **2030 Agenda**, and to facilitate the **transition to a low-carbon sustainable economic development** across all sectors.

- In this concept, the **clean, reliable and affordable Energy** shall be at the **core**, and act as **catalyst** for the **social, environmental, and economic empowerment** of Brava, leveraging international **best practice and proven technologies**, and taking advantage of the **local knowledge and traditions** and **preserving and valuing the natural and cultural values** of Brava.

Source: Brava Sustainable Island Concept NOte. MAeAQL

Sustainable Development Project Components

Sustainability Project Component	Sub-component
1. Renewable Energy	1.1. Independent Producers (IPPs)
	1.2. Distributed Generation (DER)
2. Energy Efficiency	2.1. Home appliances
	2.2. Public Lightings
	2.3. Demand Response
3. Energy storage	3.1. Behind The Meter (BTM)
	3.2. Front of Meter (Grid scale)
	3.3. Long-term storage (stational storage)
4. Smart Grids	4.1. Grid operation & monitoring
	4.2. Dispatch and EMS applications
	4.3. Customer Smart Metering
5. Electric Transport	5.1. Inter-island
	5.2. Public and Urban transport
	5.3. Private transport
	5.4. Fishery boats
6. Water and sanitation	6.1. Desalination facilities
	6.2. Distribution network
	6.3. Loss control
	6.4 Water harvesting
	6.5 Waste water drainage system
	6.6 Waste water treatment
	6.7 Faecal sludge treatment
7. Waste management	7.1. Waste deposition
	7.2. Recycling
8. Economy sectors	8.1. Fishery
	8.2. Agriculture
	8.3. Industry
	8.4. Tourism

Source: Brava Sustainable Island Concept NOte. MAeAQL

Electric Mobility Policy Letter

- Strategic vision for the adoption of electro-mobility in the country and the implementation of a public charging infrastructure.
- Key objectives:
  - Public Administration with 100% of electrical vehicles by 2030.
  - National public charging infrastructure by 2030.
- All vehicles to be electrical by 2050

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Action Plan

Vehicle Axis

Updating the legal framework; Incentives for VE; Participation of the Public Administration in the Promotion of the Electric Mobility Market;

Recharging Infrastructure Axis

Definition of the standards to be adopted in Cape Verde; Management of the implementation of the National Recharge Infrastructure (INR); Mobilize Resources to Support the Acquisition of Private Recharge Stations; Guarantee the Right of Access to Recharge Points;

Energy Axis

Approve Technical and Safety Regulations; Ensure the Quality of Electric Energy Service; Reform the Tariff Structure; Regulate Commercial Relations.

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PromAE

Output 1	Electric Mobility Facility
Output 2	Commercial charging infrastructure
Output 3	Legal and regulatory framework
Output 4	Electric buses
Output 5	Capacity development
Output 6	Monitoring and reporting of GHG emissions
Output 7	Awareness raising
Output 8	Grid integration

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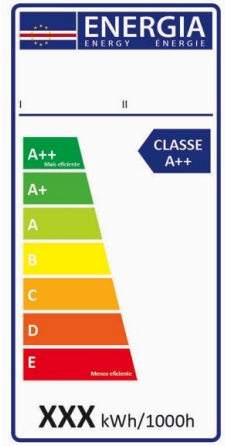
National Electrical Appliances Labeling Program

1. Approved Decree-Law No. 25/2019, which Creates the National System of Labeling and Requirements for Electrical Appliances. It came into force on 1st January 2020.

Warranty Seal

These are national guarantee seals that can be applied to equipment with minimum energy class "A", the placement of which is not mandatory;



COMPARATIVE LABELS

These indicate the energy performance of electrical equipment and their placement is mandatory;On the comparative labels we find the Energy Classes, which classify the electrical equipment according to their energy consumption, on a descending scale from most efficient to least efficient.

National Electrical Appliances Labeling Program

		MEPs: entry in Cabo Verde	MEPs: to get the Warranty Seal
	Air Conditioner	4,10 ≤ SEER **Classe C**	5,10 ≤ EER **Classe A**
		N/A	N/A
	TVs	IEE < 0,60 **Classe D**	IEE < 0,23 **Classe A**
	Freezer	IEE < 75 **Classe B**	IEE < 55 **Classe A**
	Lamps *Direccionais*	IEE < 0,95 **Classe C**	IEE < 0,18 **Classe A**
	Não Direccionais	IEE < 0,60 **Classe C**	IEE < 0,17 **Classe A**
	Electric Water Heater	$\eta_{wh} \geq 35$ **Classe D**	$\eta_{wh} \geq 100$ **Classe A**
	Wash Machine	IEE < 59 **Classe A**	IEE < 59 **Classe A**

Energy Efficiency Code for Buildings (CEEE)

Joint Decree No. 24/2020:
Approves the Energy Efficiency Code for Buildings (CEEE)

- **Purpose of the code**

The objective of the CEEE is to provide minimum requirements for the design and construction of energy efficient buildings. The Code also provides an additional set of requirements for buildings to achieve improved levels of energy efficiency.

- **Scope of the Code and Applicability**

The CEEE is applicable to all new buildings and existing buildings undergoing major retrofits.

Green Bonds

Purpose:

- The main purpose of this regulation is to enhance the key role that debt markets can play in financing projects that contribute to environmental sustainability, social development and poverty reduction, that promote sustainable economic growth and capacity building to resist and manage in advance the adverse effects of climate change.

Source: Cabo Verde Bank (BCV) Regulation nr. 1/2021, that aprove the Norms for the Emission of Green Bonds in Cabo Verde

Green Bonds

Eligible Projects and Assets:

- Eligible projects and assets are those whose investments fall within the scope of the specifications of this regulation and are intended to promote Cabo Verde's transition to a low carbon, climate resilient and environmentally sustainable economy namely, but not limited to, in the following sectors:

  (a) renewable energy and energy efficiency;

  (b) climate change resilience for areas and sectors of high vulnerability;

  (c) clean and resilient transport;

  (d) reduction of pollution and greenhouse gas emissions;

  (e) water efficiency and wastewater management;

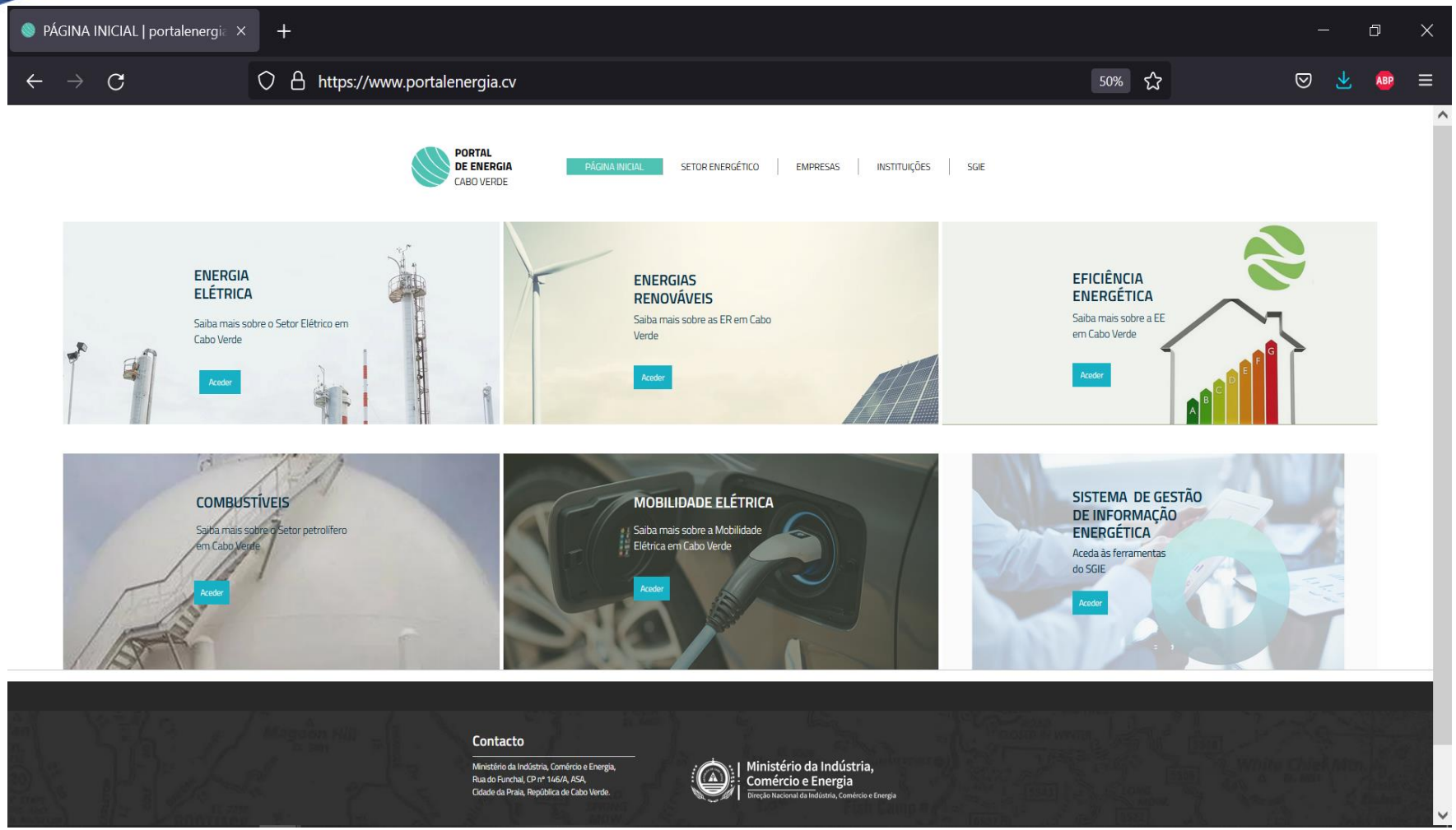
  (f) sustainable management of natural resources;

  (g) eco-efficiency.

Source: Cabo Verde Bank (BCV) Regulation nr. 1/2021, that aprove the Norms for the Emission of Green Bonds in Cabo Verde

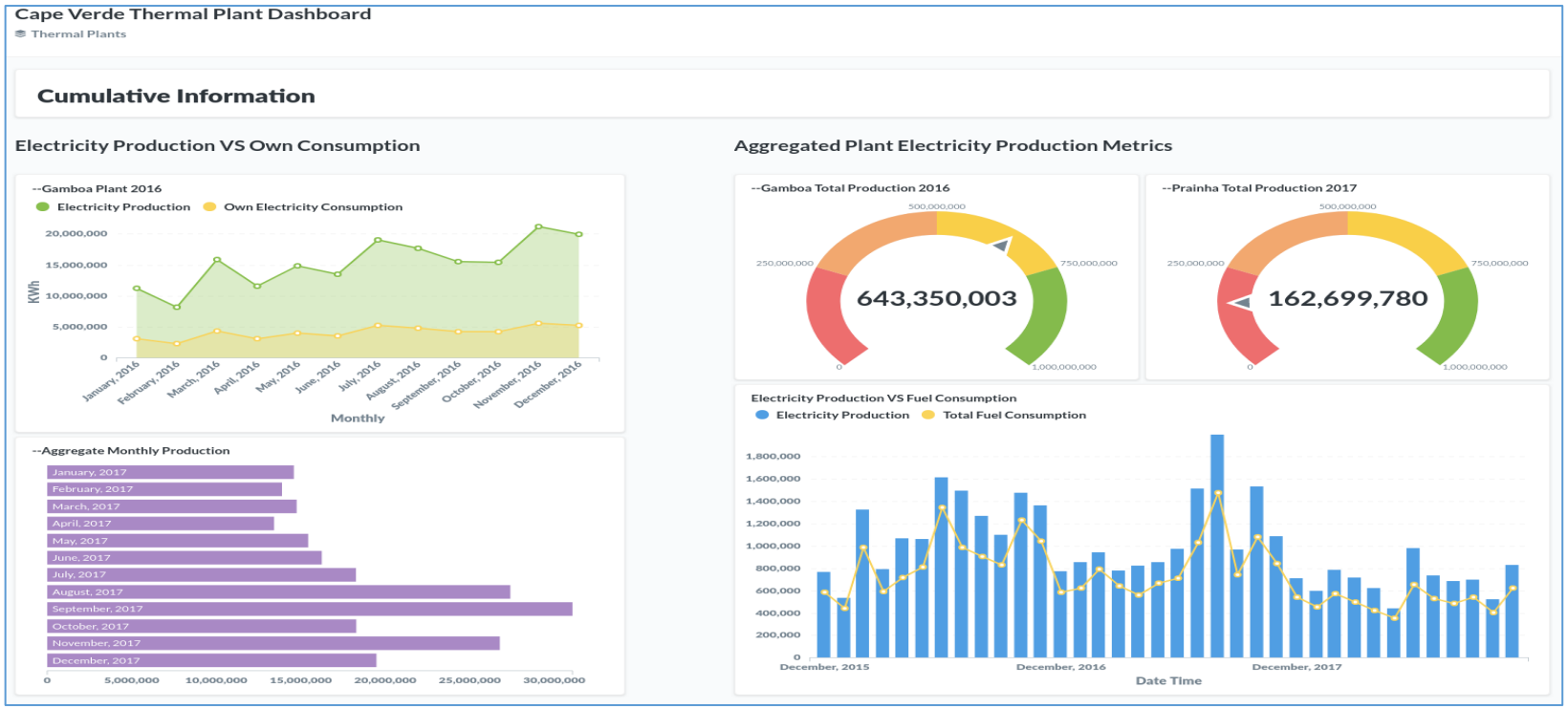
Energy Portal and Energy Information System

Energy Sector Communication



Energy Portal and Energy Information System

Example: Statistics



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Thank you!

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