

July 2024 – 1º SEMINÁRIO DE ENERGIA E CLIMA DA CPLP

NEW APPROACH IN THE WATER AND ENERGY SECTOR





01 Group and Company overview

02 Country and Sector

03 APP balance – Road to 25th anniversary

04 PV / Energy Company Current Focus

04.1 Basics services supply / Water and Energy Nexus

04.2 Energy Utility Scale Power Plants and Storage

04.3 Industrial / Tourism / Leisure solutions

04.4 Sustainability Projects

04.5 Electro Mobility Project

05 Our Approach

01 GROUP: Background

> 20 years the renewable sector

> 45 years in the energy sector

> 90 years in logistics and infrastructure management sector

Family Blay 1928

EBRSA 1968
TERSACO 1981
TCB 1992
INVERSAGIT, SL 1998

Family Rovira 1975

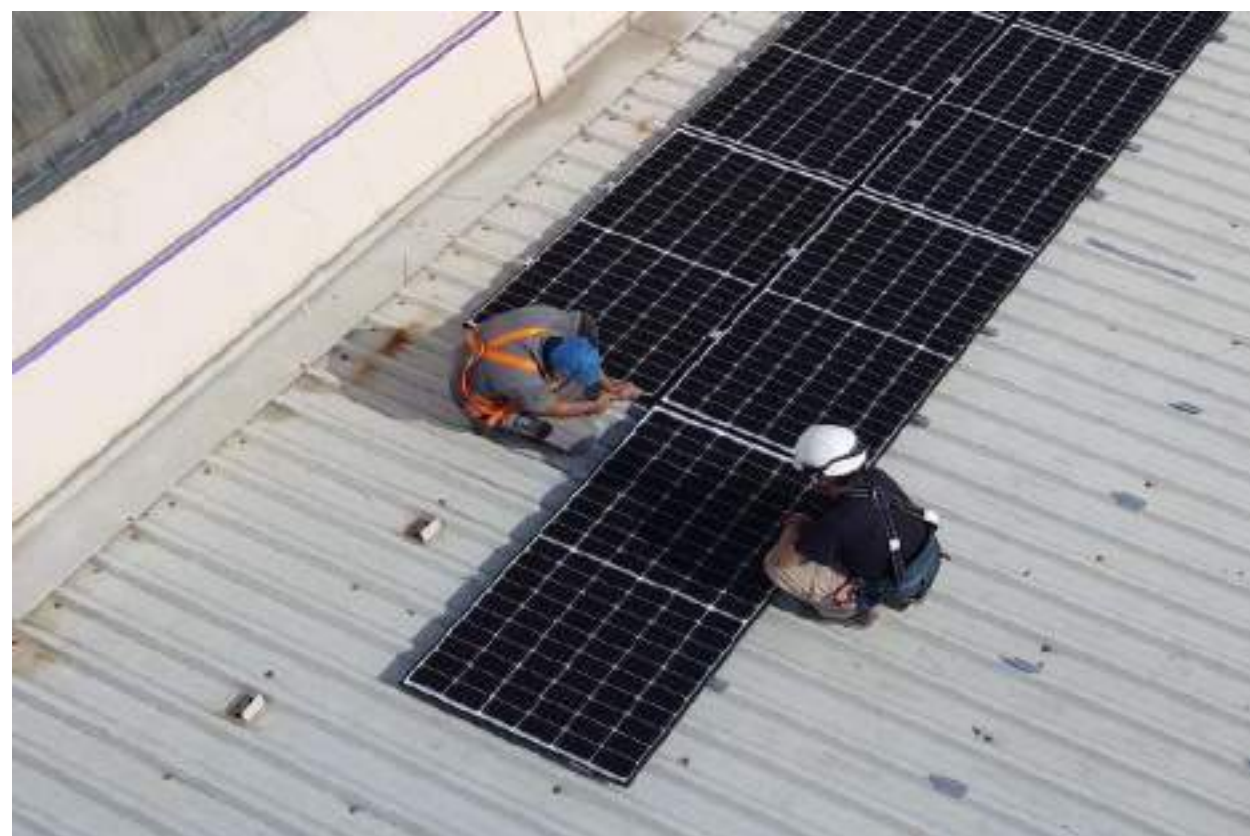
GASOILS ROVIRA, SL 1992



01 GROUP: Current Activities



Development, Investment and Operation of Water Cycle and Energy Infrastructures for Utility Services



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02 COUNTRY and SECTOR: Cabo Verde

GEOGRAPHICALLY

- Located 500 km off the west coast of Africa
- **10 islands archipelago, 9 of which are inhabited.**
- **Connectivity issues** for service delivery, energy, water, education and health.
- Only 10% of its territory is classified as arable land and mineral resources are limited.

SOCIOECONOMIC

- **Growing cenário** / Growth average (2016-19) 4.7 % (3.4 in per capita terms)
- **Poverty decline** from 24.5 % in 2015 to 11.5 % in 2019
- Overall **deficit** 1.8 % (2019) / 8.9 % (2020)
- Development Partners are key contributors

TRADE BALANCE

- On the demand side it was driven by net exports and private investment and consumption.
- On the supply side growth was driven by tourism activities and growth in domestic non-tradable services.
- The privatization efforts of the government helped support investor and consumer confidence.

ENERGY and WATER

Strategic factor for sustainable development
High dependence on primary energy sources.
Energy demand increasing (challenge)

Water Origen
97% Desalination

AREA - 4.033 km² (10 islands + 5 minors)

POPULATION (2020) - 556.857

GDP (2019) - 2.012.-M€ /

GNI per capita - 3.600.-€

TOURISM (2019) - 20% GDP



02 THE ORIGINAL PROJECT: The country, Cabo Verde

ENERGY

- Strategic factor for sustainable development
- High dependence on primary energy sources.
- Energy demand increasing (challenge)
 - *National Energy Sustainability Program (PNSE)*
 - *Energy Efficiency in Equipment and Buildings Project (PEEE)*

Fossil Fuel import

- Aprox 400.-M€
- 418.000.-Tn (2023)
- 172.000.-Tn (2020)
- 210.000.-Tn (2019)

Uses

- 39% Intl. Marine
- 25% Aviation
- 18% Energy Production

Ilha (2023)	Termical Prod. (kWh)	Renewable Prod. (kWh)		Total Production (kWh)
Santiago	229.945.529	33.889.387	12,8%	263.834.916
→ Sal	84.633.745	22.258.047	20,8%	106.891.792
→ Sao Vicente	63.921.577	22.822.592	26,3%	86.744.169
Boa Vista	40.295.059	6.616.180	14,1%	46.911.239
→ Santo Antão	17.330.151	1.850.213	9,6%	19.180.364
→ Fogo	16.639.608	-	0,0%	16.639.608
→ Sao Nicolau	7.658.746	-	0,0%	7.658.746
→ Maio	4.007.696	-	0,0%	4.007.696
Brava	3.031.746	-	0,0%	3.031.746

Total Production (kWh)		554.900.276	
Termical Prod. (kWh)	467.463.857		84,2%
Renewable Prod. (kWh)	87.436.419		15,8%
	Solar	10.590.785	1,9%
	Wind	76.845.634	13,8%



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→ 03 **APP balance - Road to 25th anniversary**

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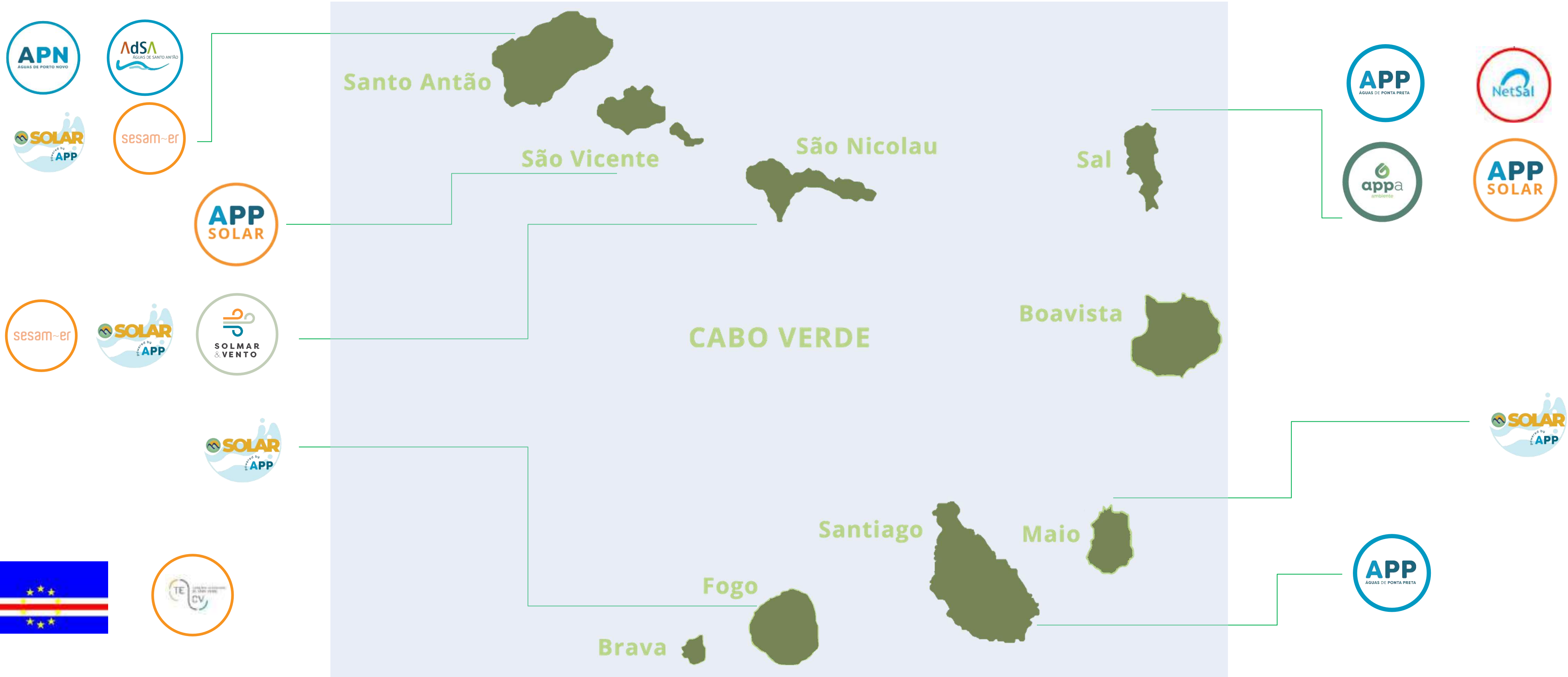
05 Our Approach

03 APP balance: Massive integration of renewables

Integrated System Management Energy + Integrated Water Cycle



03 APP balance - Road to 25th anniversary: Geographical location



03 APP balance - Road to 25th anniversary: Basic services

WATER PRODUCTION AND SUPPLY

Developed Area → 100 Ha - Santa Maria - Sal

Capacity → 10.000 pax / 400.000 pax/year

Distribution Net → 6 km

Production Capacity → 3.000m³/day

Annual Production / Distribution → 710.000 m³

ENERGY GENERATION AND DISTRIBUTION

Developed Area → 100 Ha - Santa Maria - Sal

Capacity → 10.000 pax / 400.000 pax/year

Distribution Net → 5 km

Installed Capacity → 10,1.-MW

Renewable Capacity → 4,1.-MWp

Annual Production / Distribution → 27.200 kWh

WASTEWATER NET, TREATMENT AND WATER REUSE

Sal Island Surface Area → 220 km²

Population → 40.000 hab + 10.000 pax

Net → 70 km + 9 Pump Stations

Treatment Capacity → 4.500m³/day

Annual Production / Distribution → 656.000 m³

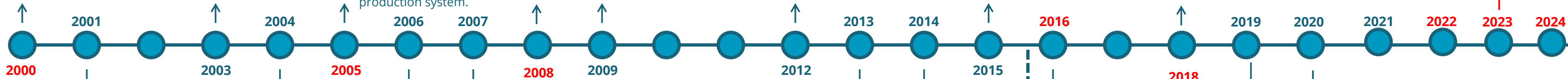


MANAGEMENT - TECHNOLOGICAL SYSTEMS
SCADA + INTERNET + REMOTE MESUREMENT + TELECONTROL
SSG - SUSTAINABLE SMART GRID

03 APP balance - Road to 25th anniversary



MAY
Constitution **Águas de Ponta Preta (APP)**



- 2001: 1st desalination plant reverse osmosis technology (500 m³/day)
- 2001: First cubic meter desalinated
- 2001: Supply of drinking water to Hotels by trucks
- 2001: Installation of the first Water Quality Laboratory
- 2001: Connection 3 hotels in Santa Maria to APP water net distribution

- 2004: Sanitation and wastewater reuse license for UPP.
- 2004: 2nd reverse osmosis desalination unit (500m³/día)

- 2006: Electric Power Plant (fuel) 3MW

- 2007: 3rd reverse osmosis desalination unit (1.000m³/day)

- 2008: Installation 4th reverse osmosis desalination unit (1.000m³/day)

- 2013: Provisional Sanitation License for Santa Maria
- 2014: ISO9001
- 2015: Certification HACCP

- 2016: Sal Island Sanitation Concession

- 2018: Upgrade Ind. Laundry
- 2018: Electric Vehicles

- 2020: Ampliation Santa Maria WWTP



DESALINIZED WATER		TREATED WASTEWATER	
• PRODUCED	11,7 Hm ³	• PRODUCED	5,4 Hm ³
• DISTRIBUTED	11,3 Hm ³	• REUSED REGENERATED WATER	3,9 Hm ³
ELECTRICITY PRODUCED		LAUDRY SERVICE	
310 GWh		30,19 Tn	

03 APP balance - Road to 25th anniversary: Achievement

Direct investment > 40 M€
Work force > 190 stable jobs
Local work force > 95%

FINANCING STRUCTURE

2000-17 → Project Finance EU commercial bank (BancSabadell + BCA)
2017 - ... → Banca Caboverdiana (CECV / BCN / BAI / ...)
2023 - ... → Capital Markets / Green Bonds (BVCV / ...)

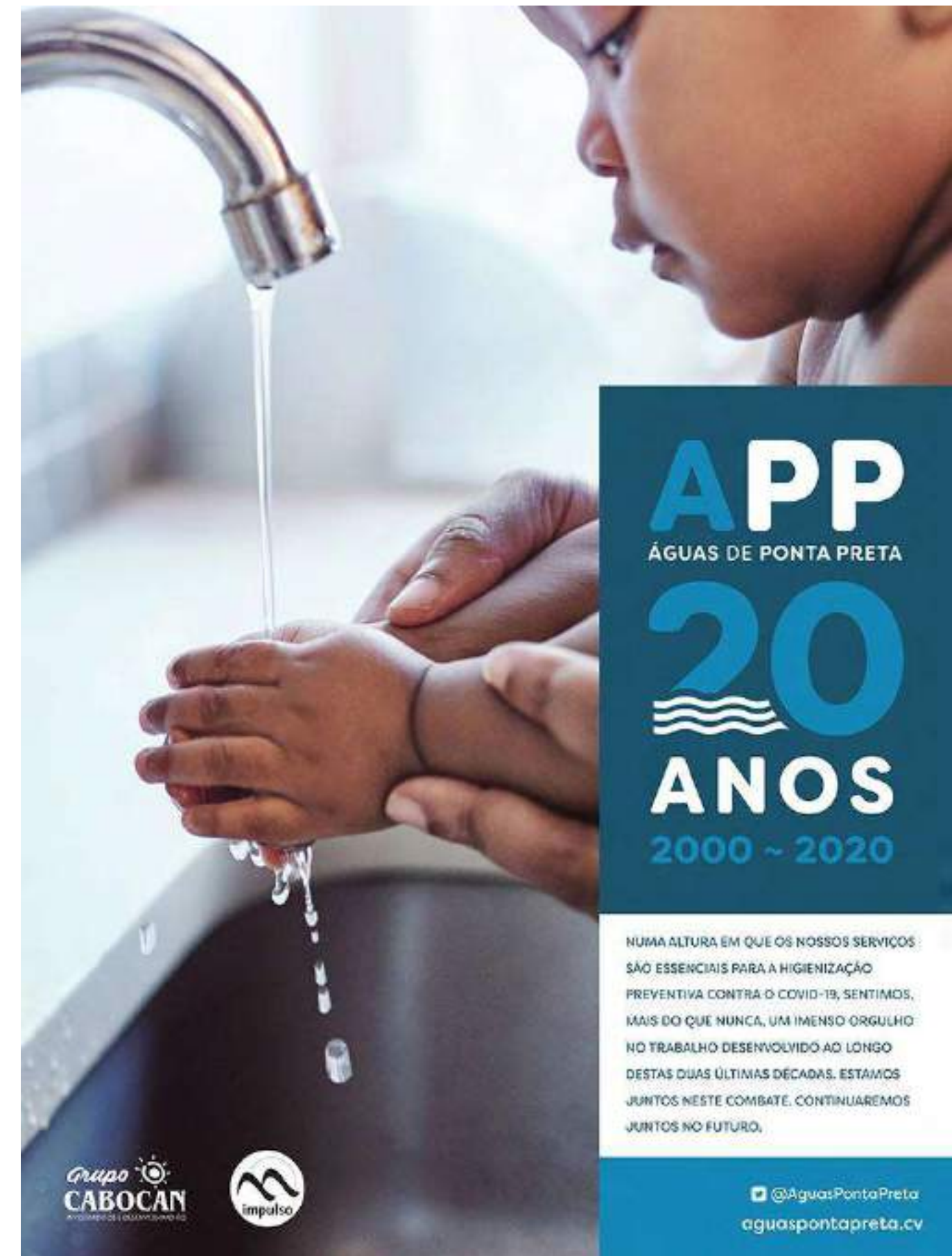
Promoting Public-Private partnerships

National Authorities / Local Authorities
Develop and Multilateral partners / UE

Ensuring provision of **basic services**, energy, water and sanitation.
Complementing the public concessionaire in the tourist development of Santa Maria

Transfer of cutting-edge **technology** in energy and water sector
Transfer of **industrial culture** and training to skilled jobs

Take care of resources / Waste to Resource / "0" emptying of wastewater at sea



03 APP balance - Road to 25th anniversary: Quality Commitment

3 of the 4 main companies are certified with **ISO9001: 2015**

and 2 are certified with **HACCP** certified (food safety)



NEXT STEPS

ISO45001 – Safety and health

ISO50001 – Energetic efficiency

ISO14001 – Environmental Management

ISO22000 – Food safety

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PV Modules 385 Wp Monocrystalline - PERC

Aluminium supporting structure

String Inverters

Annual EE Consumption → 623 MWh

Annual PV Production → 102 MWh (16%)

Installed Power → 55 kWp

Investment → 80.000.-€ (2021)

PHOTOVOLTAIC PLANT
+
MV TRANSFORMER STATION

- 30%
- Energetic Costs

↓
Decrease Water Cost
for population

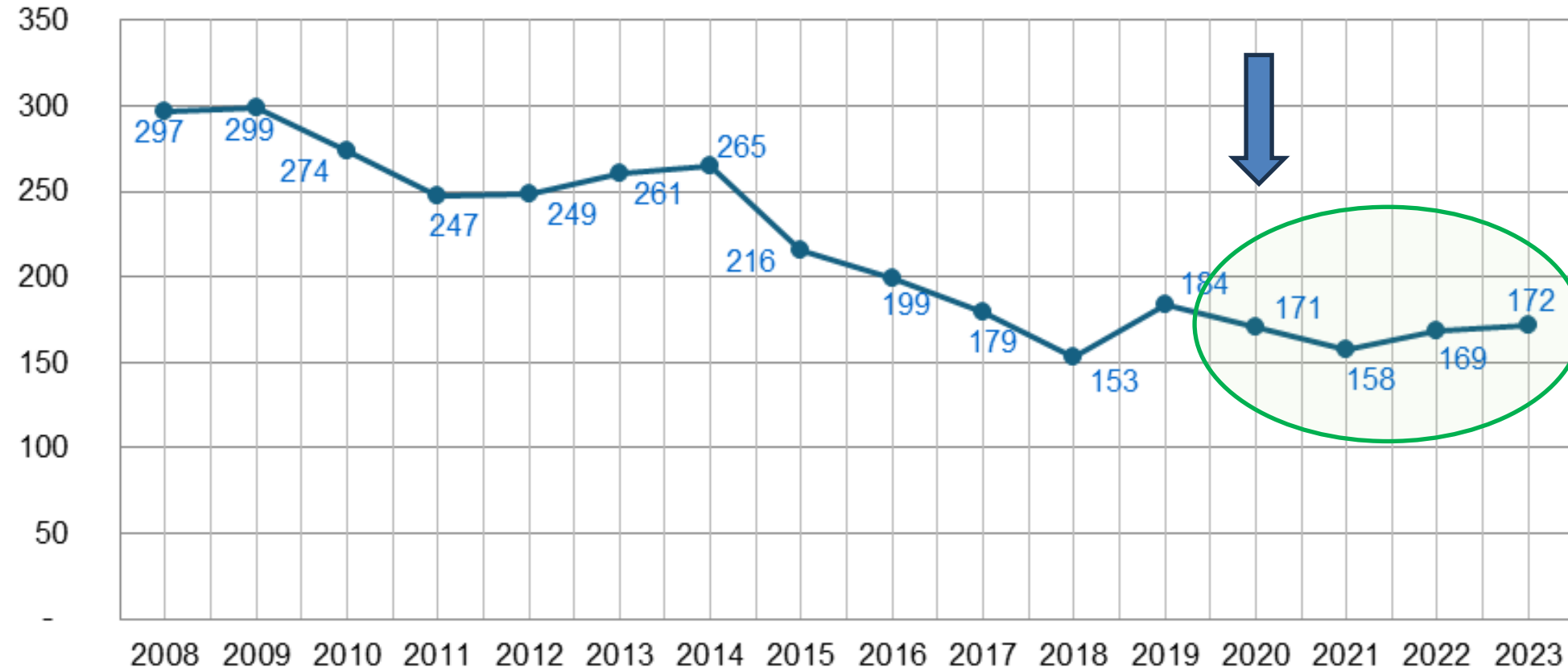
04.1a

Basics services supply / Water and Energy Nexus

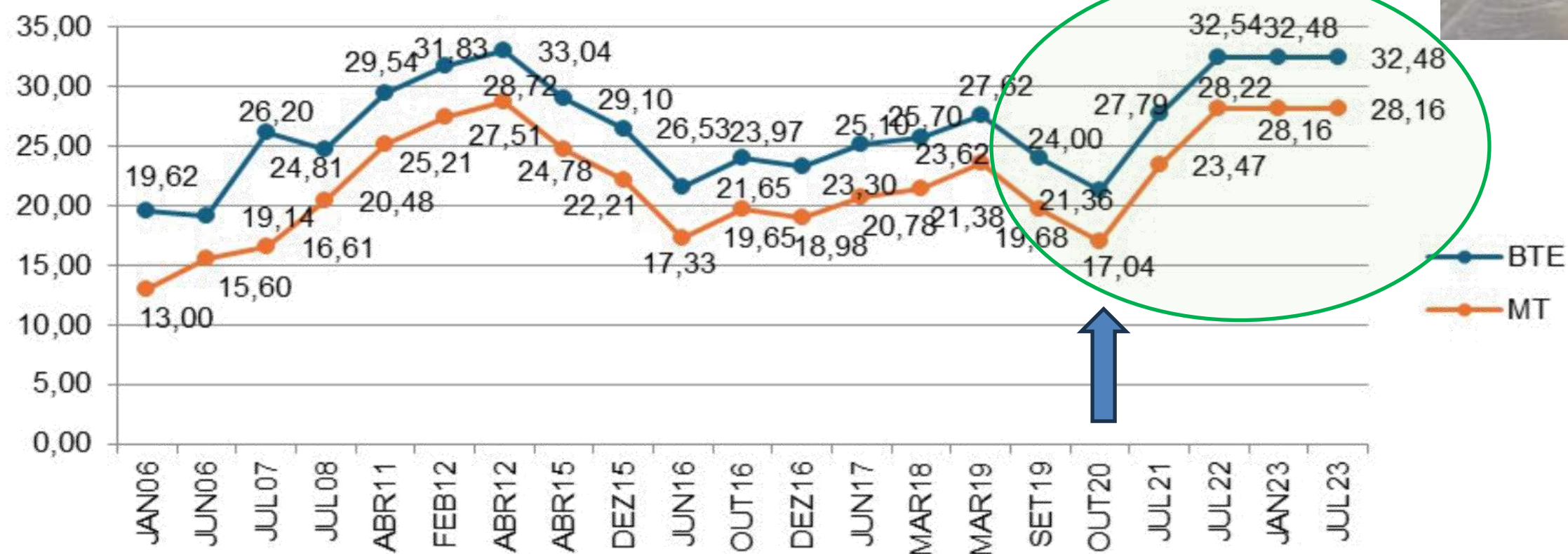
Renewable Energy at Porto Novo Desalination Plant - 55 kWp



APN Average water cost (ECV/m³)



Energy cost (ECV/kWh)



10%



30%



60% (*)



04.1b

Basics services supply / Water and Energy Nexus

Santa Maria WWTP expansion - 3.750 m³ / 302 kWp



2021 Increasing capacity

Total Investment
440.000.-kECV / 4,0.-M€
Energy CAPEX
40.000.-kECV / 360.-k€

Impacts:

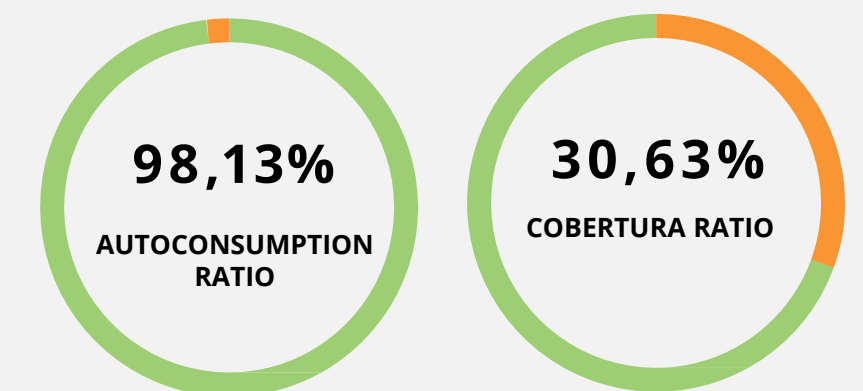
- Depuration
- Reuse water source (3 types)
- Agriculture water uses
- High energy efficiency

PV Modules (x736)
JAM72S10-410/MR
Monocrystalline - 72 cells
PERC

Aluminium supporting
structure

String Inverter
24 strings & 12 trackers
SMA-Sunny Tripower C2
3x110.-kW

Forecast
Annual PV Production
530 MWh



04.1b

Basics services supply / Water and Energy Nexus

Santa Maria WWTP expansion – 3.750 m³ / 302 kWp



2023 – Energy Consumption

Total	706,93 MWh
• Public Network	428,87 MWh
• Photovoltaic	263,44 MWh (37%)
• PV Gen. Potential	597,96 MWh

Annual Savings	8.030.-kECV / 72,8.-k€
Fossil fuel	64.-Tn / 75.300.-l
CO ₂ Emission	174.-Tn

Next step	Storage	Lithium-ion Typology
• Capacity		1 MWh
• Power		100 kW
• Investment		> 600.-k€



04.2 PV / Energy Company Current Focus

Energy Utility Scale Power Plants and Storage



Cabo Verde,
Chile and
Spain

>100 + 4 PV plants

> 20.000 kWp

8 PV power plants in progress

15.900 kWp

04.2 PV / Energy Company Current Focus

Energy Utility Scale Power Plants and Storage



04.2a PV / Energy Company Current Focus

Energy Utility Scale Power Plants



Solar Photovoltaic Power Plants on São Vicente and Sal islands / 2 x 6.-MWp

Duration - 25 years

International standards, guarantees and bankability conditions.

Fixed Price in two periods 15 years + 10 years

Reference Production and Performance Parameters defined
Monthly invoicing

Take or Pay of 80% of the generation

Price Energy Supplied	Period 1 Years 1 to 15	Period 2 Years 16 to 25
SAL	4,995.-ECV/kWh 45,30.-€/MWh	3,497.-ECV/kWh 31,71.-€/MWh
SÃO VICENTE	5,790.-ECV/kWh 52,51.-€/MWh	4,053.-ECV/kWh 36,76.-€/MWh

Structured in 3 complementary contract

- IMPLEMENTATION AGREEMENT (IA)
- POWER PURCHASE AGREEMENT (PPA) - State supported
- LAND LEASE AGREEMENT (LLA)

- Phase I - Engineering & Design / Financial Struct. / Guarantees
- Phase II - Construction (Commissioning)
- Phase III - Commercial Operation



04.2a PV / Energy Company Current Focus

Energy Utility Scale Power Plants



Solar Photovoltaic Power Plants on São Vicente and Sal islands / 2 x 6.-MWp

	CAPEX	Produção	Receitas	IRRp	OPEX	RCSD	PAY-BACK	VAN (i=6,5%)	Combustível Poupado	Emissões CO ₂ Evitados
	kECV	k€	MWh / year	k€/year	%	k€/year	year	k€	Tn / year	Tn / year
SAL	413.494	3.750	10.541	465	8,39%	50	> 1,20	706	2.527	9.194
SÃO VICENTE	468.626	4.250	10.847	555	8,55%	70		665	2.601	9.461
TOTAL	882.120	8.000	21.388	1.020		120		1.371	5.128	18.655
			1.782 kWh/kWp / Pf = 20,3%						4.500.-k€	95.-k€

APP IMPULSO SOLAR SAL



SPV's

APP SOLAR SVI



First **Green Bond** emission ever in CV stock market (2023)



04.2a

PV / Energy Company Current Focus

Solar Photovoltaic Power Plant on Sal island - 6.-MWp



04.2b PV / Energy Company Current Focus

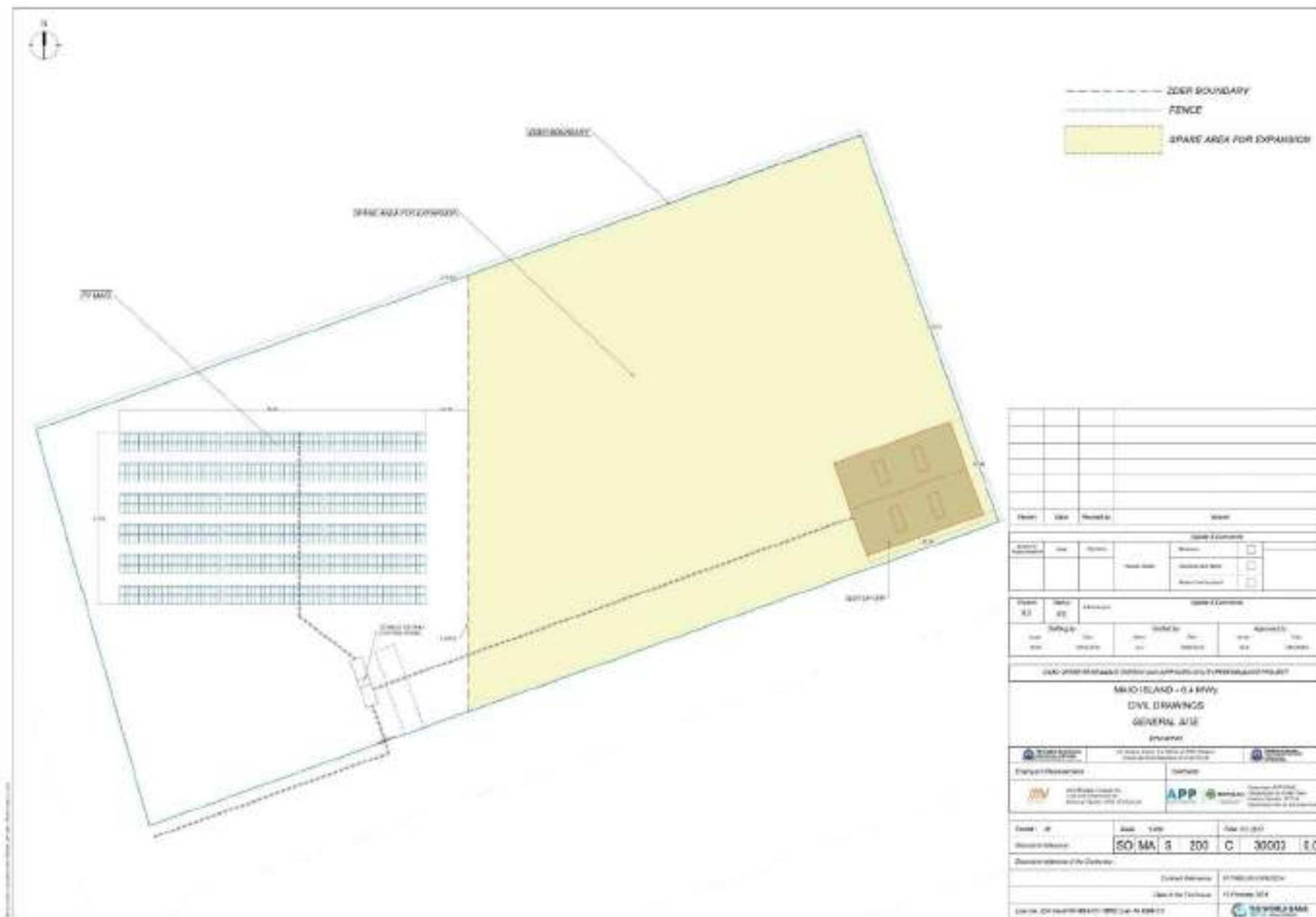
Energy Utility Scale Power Plants and Storage

“Projeto Energias Renováveis e Melhoria da Eficiência Energética nos Serviços Públicos - 009/ REIUP/UGPE –”



Structured in 1 EPC contract for 4 independent plants in:

- Fogo 1,3 MW
 - Santo Antão 1,2 MW
 - São Nicolau 0,4 MW
 - Maio 0,4 MW
- } 3,3 MW



Contract Value: 3.268.513.-€ / 360 402 631.-ECV
 Reference Production and Performance Parameters mandatory

Employer representative/supervisor:

- Construction - 17 months**
- Maio
 - Fogo
 - São Nicolau
 - Santo Antão

Operation - 24 months



04.2

PV / Energy Company Current Focus

Energy Utility Scale Power Plants and Storage



PVSA - Photovoltaic Solar Power Plant with Storage on Santo Antão island

- 719.-kWp
- 669.-kWh



Storage APP Solar Plant / Sal island 3.000.-kWh

Storage Santa Maria WWTP / Sal island 1.500.-kWh

Floating Photovoltaic Solar Power Plant with storage on WWTP Espargos / Sal island

- 1.000.-kWp
- 6.000.-kWh



04.3 PV / Energy Company Current Focus / Distributed Generation Industrial, Hotels and institutional focus solutions



04.3 PV / Energy Company Current Focus / Distributed Generation Resorts, Hotels and leisure solutions



2019-2024
187.-kWp



2019
13.-kWp
+storage



Hilton

2023
126.-kWp

Ninho dos Piratas

2023
39.-kWp
+storage

04.3 PV / Energy Company Current Focus

Distributed Generation

	CENTRAL FOTOVOLTAICA	ILHA	DONO	POTÊNCIA (kWp)	TIPO	ANO INÍCIO
TOTAL OPERATION 4.614 kWp	1 Monte Trigo	Santo Antão	CM Porto Novo	38	off-grid	2012
	2 ETAR-Ponta Preta	Sal	APP	21	on-grid	2015
	3 Carriçal	São Nicolau	CM Ribeira Brava	22	off-grid	2015
	4 Santa Maria-Fátima	Sal	ELECTRA	2.344	on-grid	2016
	5 Salmoura	Sal	APP	17	on-grid	2016
	6 Telecontrolo-Ponta Preta	Sal	APP	33	on-grid	2018
	7 NETSAL-Ponta Preta	Sal	APP	117	on-grid	2018
	8 Terreno-Ponta Preta	Sal	APP	972	on-grid	2018
	9 Armazém-Ponta Preta	Sal	APP	77	on-grid	2018
	10 Parking-Ponta Preta	Sal	APP	118	on-grid	2019
	11 Hotel Odjo d'Água	Sal	Hotel Odjo d'Água	78	on-grid	2019
	12 Residência Palha Verde	Sal	Hotel Odjo d'Água	6	on-grid	2019
	13 Figueiras	Santo Antão	CM Ribeira Grande	38	off-grid	2019
	14 Ribeira Alta	Santo Antão	CM Ribeira Grande	22	off-grid	2019
	15 Planalto Norte	Santo Antão	CM Porto Novo	22	off-grid	2019
	16 Academico Aeroporto	Sal	AAAS (Academia futebol)	9	on-grid	2019
	17 Alto Solarim	Sal	Cooperativa Agricola Alto Solarim	14	off-grid	2019
	18 Escola Kate Surf Mitu & Djo	Sal	KiteSurf Mitu&Djo	13	off-grid	2019
	19 ETAR – Santa Maria	Sal	app-ambiente	302	on-grid	2022
	20 Ninho dos Piratas	Sal	JS-Actividades Náuticas	39	off-grid	2023
	21 Hotel Hilton	Sal	APP	126	on-grid	2023
	22 Supermercado SUCATA	Sal	Supermercado SUCATA	42	on-grid	2023
	23 Bolona	Santo Antão	CM Porto Novo	15	off-grid	2024
	24 Posto Shell Espargos	Sal	TECV	20	on-grid	2024
	25 Hotel Odjo d'Água	Sal	Hotel Odjo d'Água	109	on-grid	2024

Bolona - Santo Antão



2024
15.-kWp + storage

Distribution
Connections
20 family units



04.4b

PV / Energy Company Current Focus Sustainability Projects / Monte Trigo

Monte Trigo - Santo Antão



Monte Trigo
40 kWp

Monte Trigo - Casa de Gelo
15 kWp

1st Location 100% Renewable (2012)

Partnership Coordinated by APP (CMPN / UE)

275 Inhabitants Benefited



04.4c PV / Energy Company Current Focus

Sustainability Projects / Ecocentro Santa Maria



Wastewater + Rainwater Pump Station

Waste Collection Point

Electrical Vehicle Charging Hub

Self-service Domestic Laundry

REN

Coworking



04.5 CURRENT COMPANY FOCUS

Electro Mobility Project



**A KICK-OFF DECISION
2019**

**ELECTRICAL
MOBILITY
ACTION PLAN
(PNME)**

PILOT EXPERIENCE

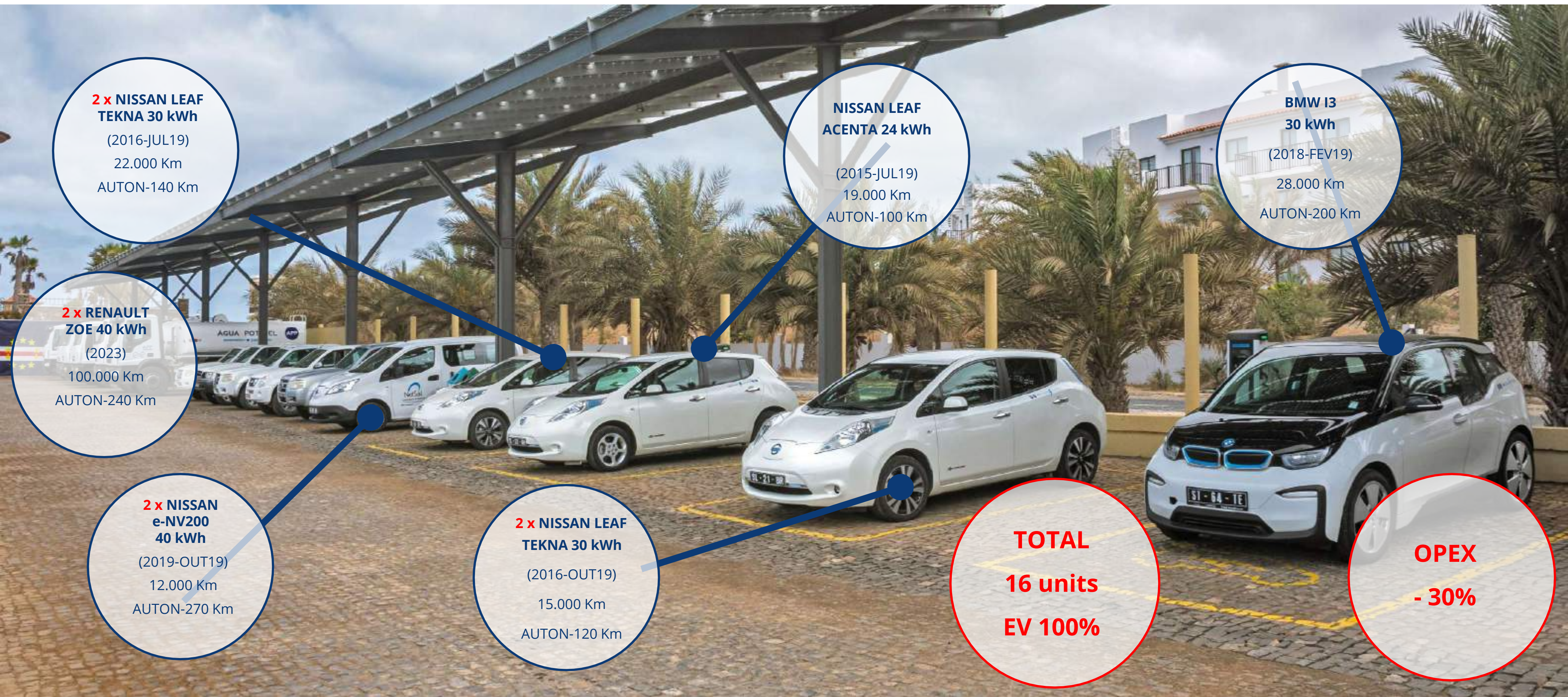
**07/02/2019
FIRST EV
100% IN CV**

7 UNITS



04.5 CURRENT COMPANY FOCUS

Electro Mobility Project / Fleet



04.5 CURRENT COMPANY FOCUS

Electro Mobility Project / Highlights

2018
APP
ÁGUAS DE PONTA PRETA



2022 First Public EV Charge Point in Cabo Verde



2024



2023 ProMEC Program
20 units / 9 islands



Operation units
5 islands

- ProMEC - 23
- TECV - 8
- GovCV - 3



Plan in Progress
ProMEC - 17 (2024)
TECV - 62



04.5 CURRENT COMPANY FOCUS

Electro Mobility Project / Magnitudes & Results



CHARGERS NETWORK PLANNED
ProMEC-40 (2024)
TECV - 70

CHARGERS NETWORK EXECUTED
ProMEC - 23
TECV - 8

ENERGY SUPPLY
43.-MWh (2023)
29.-MWh (1q'24)

REN PENETRATION
60% (2023)
30% (1q'24)

EQUIVALENT POWER INSTALLED
1.524 kW (2023)

1.700 / 1.800
kWh/kWp
year

Engagement towards fully digitalization of service



CHARGING SESSIONS
2279 (1q'24)
13.-kWh / 132'

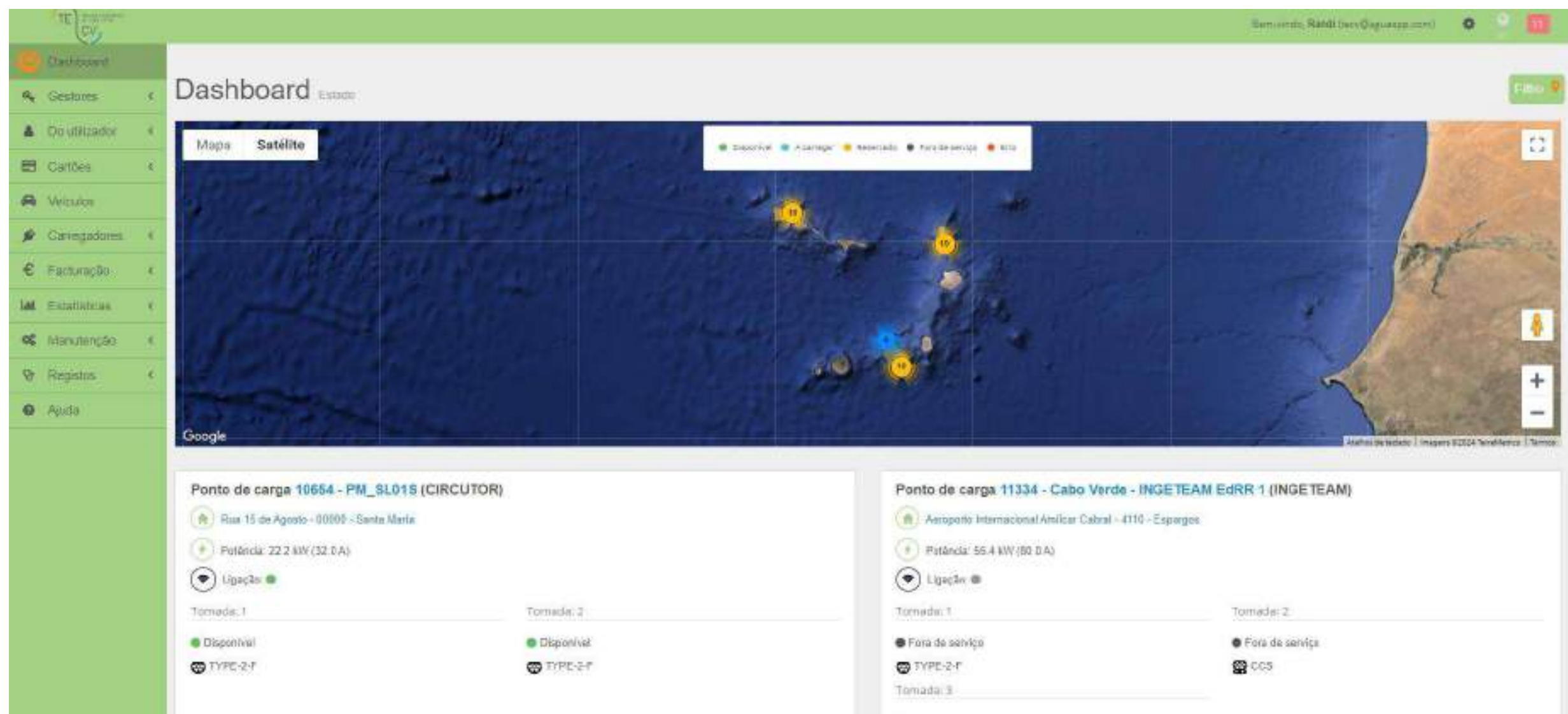
USERS 150
FREQUENT 75/100

04.5 CURRENT COMPANY FOCUS

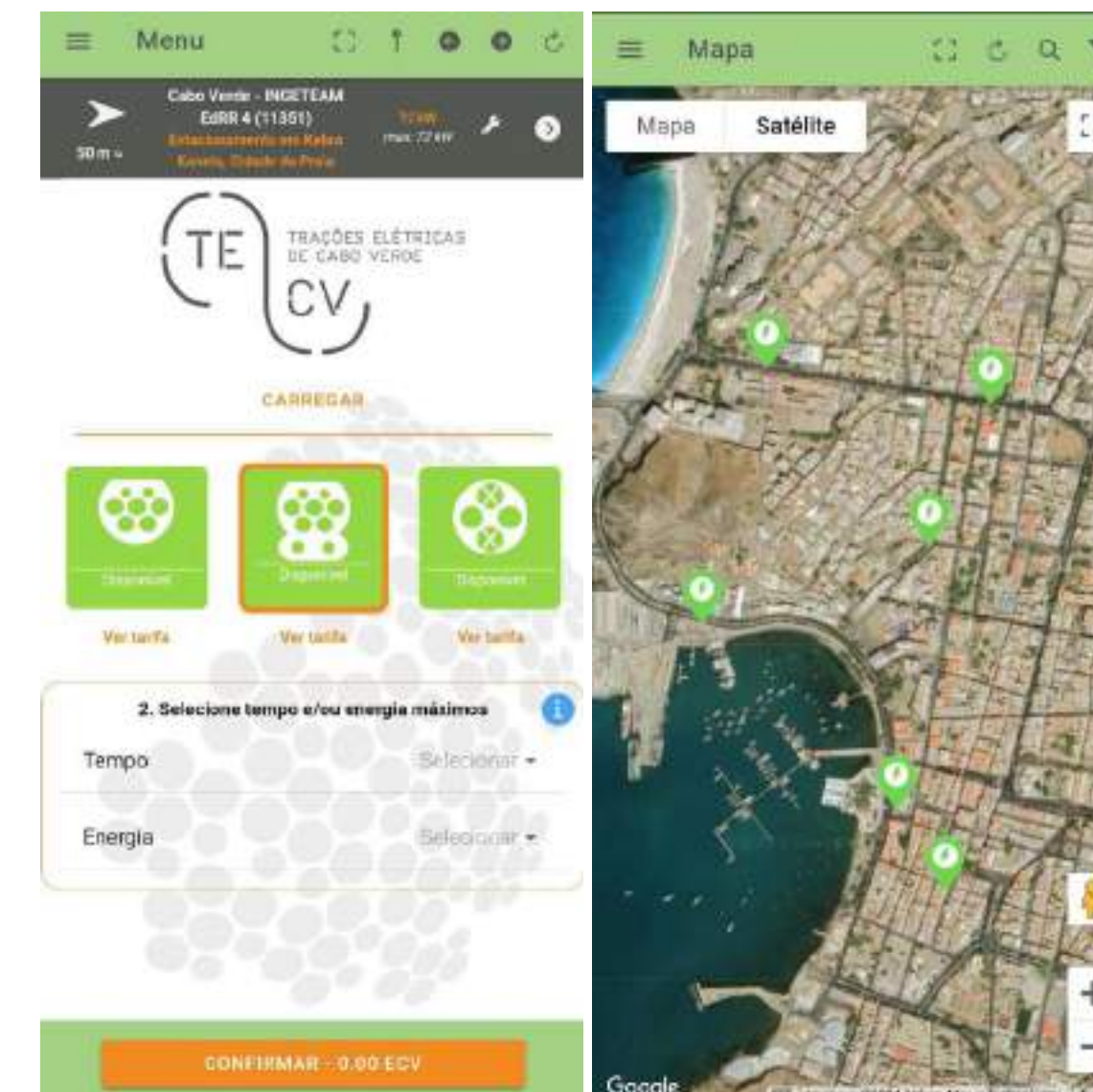
Electro Mobility Project / Digitalization



Backoffice



TECV Mobile App



Currently **34+1** chargers under remote/digital management
72 available plugs

Equivalent power installed
1.596 kW

Engagement towards fully digitalization of service



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FOCUS

TECHNOLOGY

SERVICE



INVESTMENT



PATIENCE



TEAM



SUSTAINABILITY ³



QUALITY

IMPACT





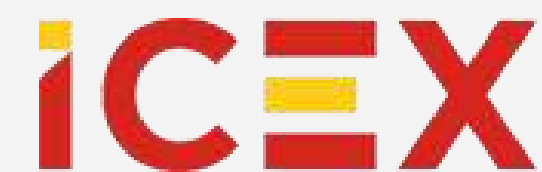
IMPULSO

www.impulsoenergia.eu

APP

ÁGUAS DE PONTA PRETA

www.aguaspp.cv



OBRIGADO PELA ATENÇÃO / THANK YOU !!!

