



ENERGY BALANCE

REUNION ISLAND

KEY FIGURES

2019

2020 EDITION

The CEO's Message

The year 2020 is a year which began under new auspices which could lead us to easily forget the events of 2019. The year 2019 was marked by the industrial commissioning of the power plant which should eventually operate at 80 % to bioethanol and, at the end of the year, the resumption of work on the revision of the Multiannual Energy Programming. Studies are also being carried out in several municipalities in order to better manage the charges of electric vehicles, the number of which is constantly increasing. 2019 was a year of investigation and prospecting that made it possible to respond to national calls for projects that will breathe new life into various sectors in the field of home renovation and promote a concrete deployment of actions in our regions, notably through the ART-MURE and SARE (Support service for energy renovation) programs.

The health crisis we are experiencing has shown us that there is a need to innovate in our businesses and our way of working, the integration of barrier gestures pushing us to find new solutions to maintain the link with our partners and quality of our work. Thus, for the production of the Energy Balance of Reunion Island 2019 edition 2020, our team was able to achieve everything by teleworking thanks to the unflinching mobilization of our data suppliers and our technical partners during, in particular, the proofreading of the document by videoconference. Changes in the way we work are helping to significantly improve our impact from both an energy and climate point of view. However, let us not forget that our economy has suffered damage and that it is necessary to find solutions to revive our businesses which are going through difficult times. The next Energy Balance report will allow us in part to assess the energy and financial impact of this crisis through its new chapters on the energy economy and the updating of the number of direct jobs in the field of energy.

Ahead of these events, a new dynamic was instilled in the "Observatoire Energie Réunion". In fact, the observatory is innovating in 2020 by offering a publication on the theme of climate in Reunion Island, which will be released in early 2021. We wish to make the Greenhouse Gases Emissions Inventory carried out since 2008 accessible to all, which lists the emissions of the island since 2004. It also allows us to put our territories back at the heart of a publication highlighting the themes of adaptation to climate change and the mitigation of greenhouse gases emissions which are high stakes for them daily. We must learn to correlate our reflections by no longer thinking distinctly of energy and climate but of energy - climate in a naturally harmonious ecosystem. The observatory will also be enriched with a new tool by the end of 2020: its website. In this age of free access to data and digital technology, creating this interface to facilitate the visualization of energy information and its sharing seemed obvious!

We must give ourselves the opportunity to measure our actions and be aware of their impacts on our territory, whether at the regional level, urban communities or municipalities. The decision-making tools such as the Energy Balance, the Greenhouse Gases Emissions Inventory, the assessment of local authorities' greenhouse gases emissions, the Territorial Climate-Air-Energy Plans must help decision-makers to better understand what is happening on a daily basis in order to adapt more and act in a long-term perspective with less apprehension about future developments. We must project ourselves sustainably and efficiently by being as informed and ambitious as possible in our choices and actions.

The changes we are going through show us that we know how to demonstrate solidarity and adaptability to pursue our actions and our commitments for an autonomous and low-emission island as recommended by the Multiannual Energy Programming and the National Low Carbon Strategy. Let us be actors in our territory and keep the will to develop our island, despite the current difficulties, to contribute on our scale, however small it may be, to the improvement of our planet.

I would like to thank all the technical and financial partners, whether private or institutional, for their active contribution to all the work carried out by the Observatoire Energie Réunion.

Alin GUEZELLO

*Regional Councillor in charge
of New and Inclusive Energies, Living Environment*

CEO of Horizon Réunion



Key figures 2019

TOTAL PRIMARY ENERGY CONSUMPTION :

17 349.9 GWh – 1 491.8 ktoe
including 12.5% from local resources

- Energy dependence rate: 87.5%
- Energy intensity per capita: 1.7 toe/capita

TOTAL FINAL ENERGY CONSUMPTION :

12 277.1 GWh – 1 055.6 ktoe

- Transportation: 64.5% - Electricity: 22.6% - Duty-free fuels and combustibles for agriculture and industry (excluding transportation) and butane gas: 6.4% - Heat: 6.8%
- Total electricity consumption per capita: 3 177 kWh/capita
- Total road fuel consumption per capita: 631.4 litres/capita

ELECTRICITY GENERATION :

3 046.9 GWh – 262.0 ktoe

- From 2009 to 2019, electricity generation increased by 1.8% per year on average
- Peak power demand: 502 MW in December
- **Share of renewable energies: 31.2% in 2019**

Penetration rate of renewable energies in electricity production from 2000 to 2019

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
46.7%	40.2%	43.0%	41.5%	39.7%	34.0%	36.2%	37.0%	36.1%	32.5%
2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
33.8%	30.2%	34.6%	37.8%	33.0%	36.1%	34.1%	32.4%	36.5%	31.2%

	Hydropower	Photovoltaic	Bagasse	Wind power	Biogas	Bioethanol
Installed capacity (MW)	133.3	197.6	210.0	16.5	4.4	41.0
Electricity generation (GWh)	417.5	259.7	239.8	12.1	15.1	6.7
Share in the electricity generation	13.7%	8.5%	7.9%	0.4%	0.4%	0.2%

SOLAR HEATING

- 173 962 individual solar water heaters
= 695 848 m² = 256.7 GWh avoided
 - 50 492 m² of collective solar water heaters
= 30.3 GWh avoided
- } → **287.0 GWh avoided**

CO₂ EMISSIONS :

4 344 kilotons, being 5.06 tCO₂/capita

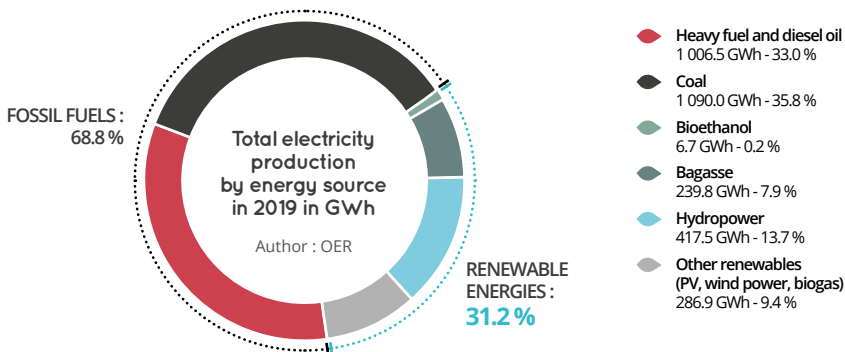
- Direct emission average ratio per consumed kWh : **719 gCO₂/ electrical kWh**

Broad indicators	2014	2015	2016	2017	2018	2019
Energy Intensity in toe / million euros (2010 constant euros)	85.30	83.88	82.42	82.25	80.35	*
Road fuels consumption per capita (L)	596	611	622	630	622	631
Primary energy quantity necessary to produce 1 ktoe of final electricity (ktoe)	2.80	2.75	2.74	2.71	2.63	2.75
Primary energy quantity necessary to produce 1 ktoe of final energy (ktoe)	1.44	1.42	1.42	1.41	1.38	1.41
Renewable energy production (GWh)	941.9	1 043.0	1 003.8	967.2	1 078.8	950.9

* 2019 GDP unknown

Electricity 2019

Electricity production : 3 046.9 GWh - 262.0 ktoe



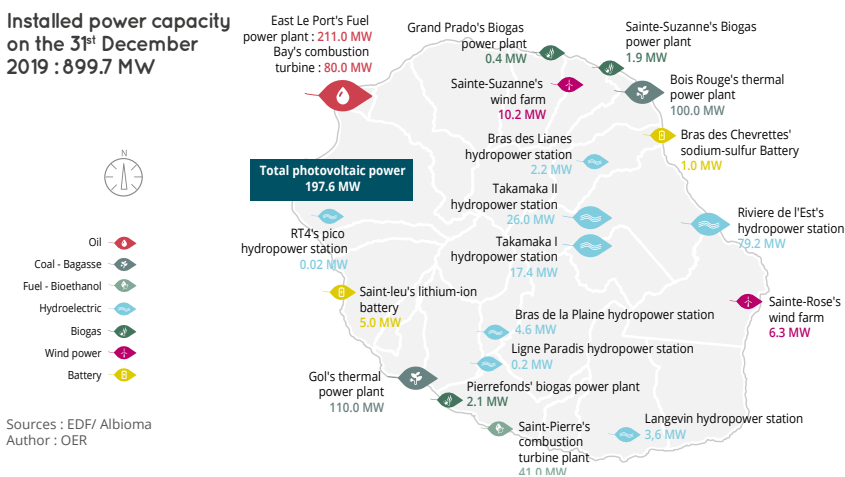
Renewable penetration rate in the electricity production in the different Non-Inter-connected Territories (NITs) and New Caledonia

Production share from renewable resources	Guadeloupe	Martinique	Reunion Island	Corsica (2018 data)	French Guiana (2018 data)	New Caledonia
2019	22%	24%	31%	37%	66%	14%

Sources : EDF Open Data for Corsica and French Guiana, OER, OMEGA, Local community of Martinique, Energy Observatory of New Caledonia

Installed power capacity : 899.7 MW

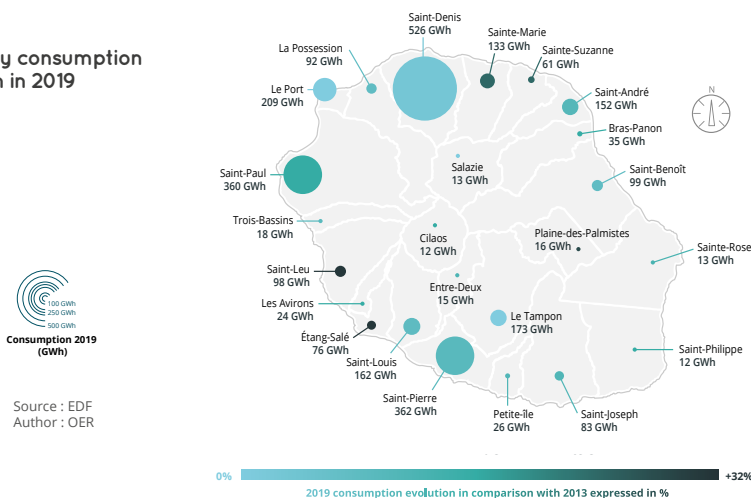
Installed power capacity on the 31st December 2019 : 899.7 MW



Sources : EDF / Albioma
Author : OER

Electricity consumption : 2 769 GWh - 238.1 ktoe

Electricity consumption per town in 2019



Source : EDF
Author : OER

Comparison of the electricity consumption per capita in the different NITs and New Caledonia

Electricity consumption per capita (MWh)	Guadeloupe	Martinique	Reunion Island	Corsica (2017 data)	French Guiana (2017 data)	New Caledonia*
2019	3.76	3.78	3.23	5.83	3.44	2.82

Sources : EDF Open Data for Corsica and French Guiana, OER, OMEGA, Local community of Martinique, Energy Observatory of New Caledonia

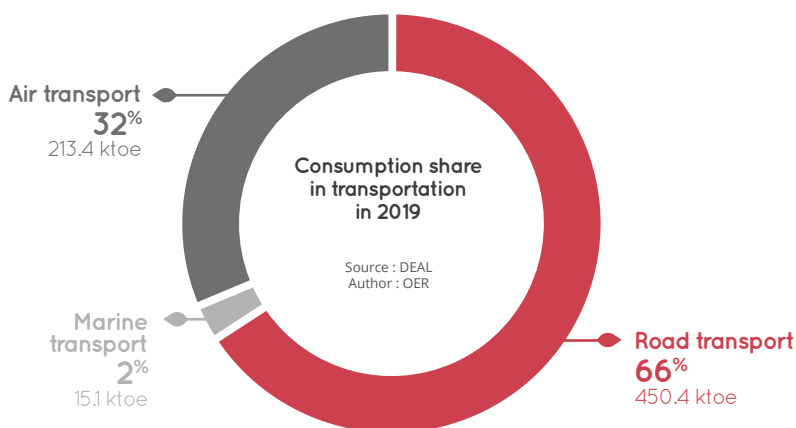
*exclusive of metal industry and mining



Transportation 2019

FUEL CONSUMPTION:

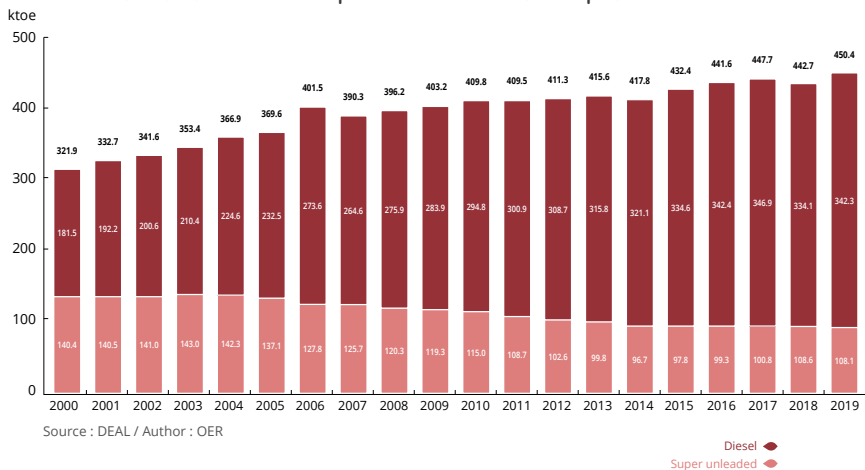
662 150 tons meaning 678.9 ktoe



CONSUMPTION IN THE ROAD TRANSPORT SECTOR :

444 118 tons meaning 450.4 ktoe

Evolution of diesel and super unleaded fuel consumption



ELECTRIC AND HYBRID TRANSPORTATION DEVELOPMENT

Cumulative number of electric and hybrid cars since 2006 :

	2006	2010	2011	2012	2013	2014	2015	2016	2017	2018
Hybrid cars	38	685	960	960	1 671	2 385	3 122	3 897	4 635	5 592
Plug-in hybrid cars	0	0	0	0	0	0	105	215	379	528
Electric cars	0	6	12	12	62	123	227	334	589	921
TOTAL	38	691	972	972	1 733	2 508	3 454	4 446	5 603	7 041

Sources : Automobile department file until 2011, Car dealers from 2013 to 2015, RSVéRO since 2016
Author : OER

In May 2020, there are **131 public power points** for electric vehicles in Reunion Island.



Primary supply 2019

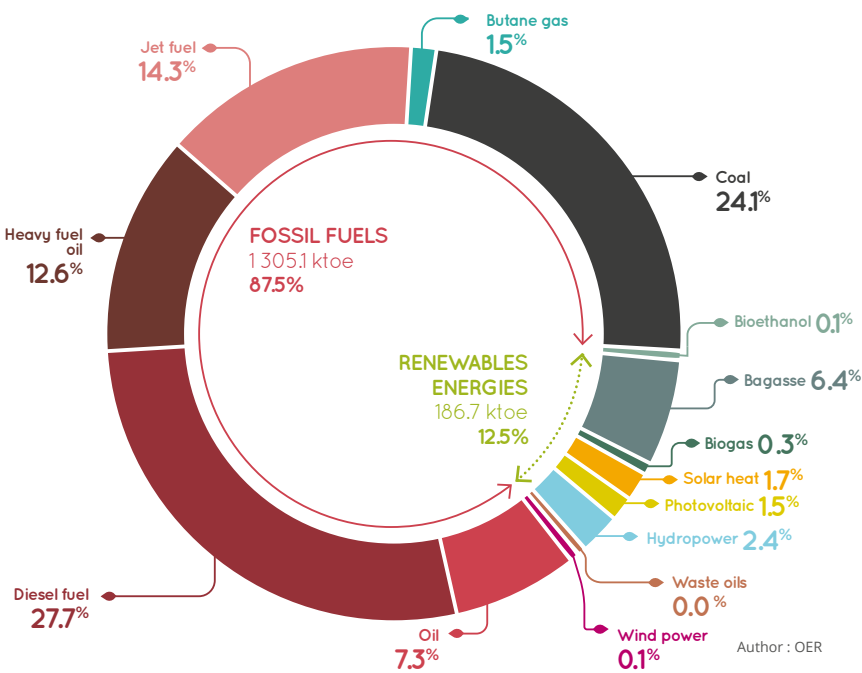
PRIMARY ENERGY SUPPLY :

17 349.9 GWh meaning 1 491.8 ktoe

		2019	
IMPORTED FOSSIL RESOURCES	Oil*	108.5	
	Diesel fuel*	413.5	
	Heavy fuel oil	187.6	
	Jet fuel*	213.4	
	Butane gas*	22.9	
	Coal	359.2	
Subtotal		1 305.1	
RENEWABLE AND RECYCLED RESOURCES	Bagasse	96.0	
	Biogas	4.8	
	Bioethanol	1.4	
	Wood	Unknown	
	Solar heat	24.7	
	Photovoltaic	22.3	
	Water	Hydropower	35.9
	Recovery	Waste oils	0.5
	Wind	Wind power	1.0
	Subtotal		186.7
	TOTAL		1 491.8

* Corresponding to the stock removals from the SRPP

Consumption share of primary energy consumption in 2019



Evolution of the energy dependence rate from 2000 to 2019

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
83.9%	85.0%	84.1%	84.6%	85.0%	87.5%	87.1%	87.4%	87.1%	87.7%
2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
87.5%	88.3%	87.2%	86.2%	86.8%	86.1%	86.6%	87.1%	87.1%	87.5%

Author : OER

Comparison of the energy dependence rate in the different NITs and New Caledonia

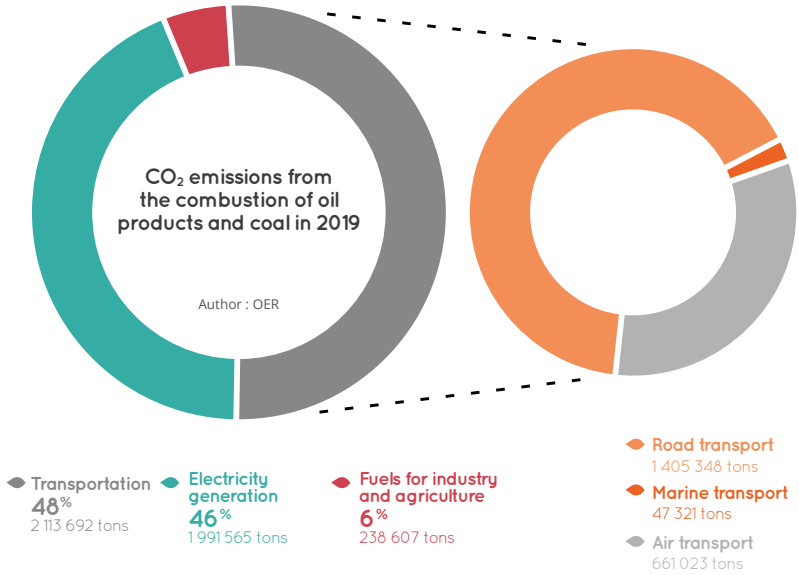
Energy dependence rate	Guadeloupe	Martinique	Reunion Island	Corsica	French Guiana	New Caledonia
2019	93.9%	93.3%	87.5%	87.5%	82.4%	97.4%

Sources : GEC for French Guiana (2016 data), OREGES from Corsica (2016 data), OER, OMEGA, Local community of Martinique, Energy Observatory of New Caledonia



Greenhouse gases 2019

CO₂ EMISSIONS FROM THE COMBUSTION OF ENERGY PRODUCTS IN REUNION ISLAND IN 2019 *



Total of CO₂ emissions from the combustion of oil products and coal : **4 344 kilotons**

Direct CO₂ emissions per capita

- Direct emissions from electricity generation: 2.32 tCO₂/capita
- Direct emission from all types of transportation: 2.46 tCO₂/capita
- Emissions from fuels for agriculture, industry and residential-tertiary sectors: 0.28 tCO₂/capita

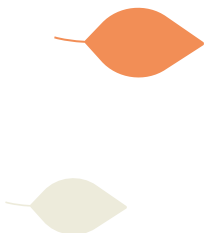
One inhabitant of Reunion Island = 5.06 tCO₂

(emissions due to the combustion of fossil fuels only)
*Simplified methodology of the GHG Emission Inventory

Comparison of the mean direct emissions ratio per kWh in the different NITs and New Caledonia

Direct emissions average ratio per kWh consumed gCO ₂ /kWh	Guadeloupe	Martinique	Reunion Island	Corsica	French Guiana	New Caledonia*
2018	786	754	679	374	299	901

Sources : EDF Open Data for Corsica and French Guiana (2017 data), OER, OMEGA, Local community of Martinique, Energy Observatory of New Caledonia
*exclusive of metal industry and mining





Energy economics 2019

COST OF FOSSIL RESOURCES IMPORTATIONS

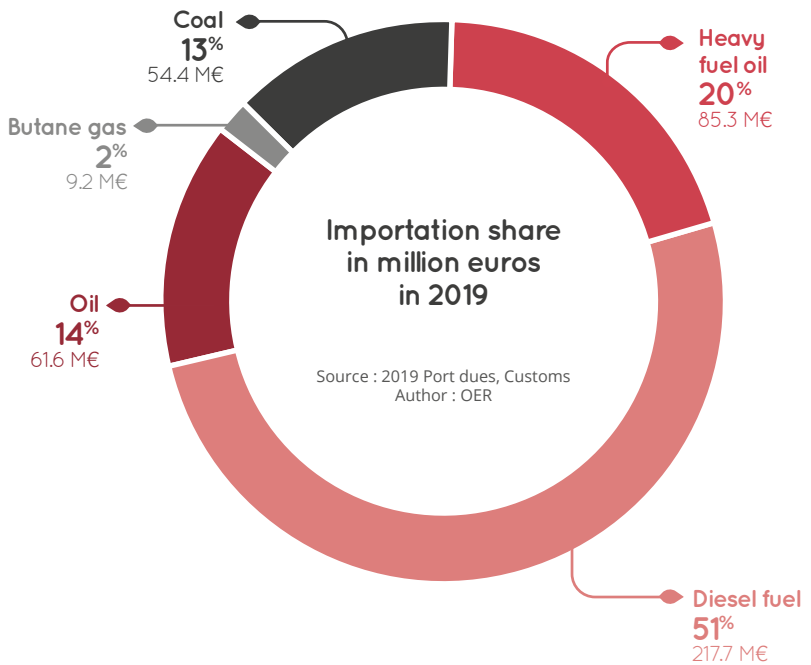
Total of fossil resources importations : **1 083.2 ktoe**

Importations value : **428.1 million euros**

Origin of the most imported resources :

- The coal comes from South Africa
- The diesel fuel comes from Singapore

Tax revenue from fossil resources importations in 2019 : **299.2 million euros**



Glossary

Bagasse :

Sugar cane residue. obtained after grinding. The bagasse can be used as a biofuel.

Energy dependency rate :

Shows the proportion of energy that an economy must import. It is defined as net energy imports divided by primary energy consumption.

Energy intensity :

Measures the energy efficiency of the country economy. The higher the intensity, the more the country consumes.

Final energy consumption :

Total energy consumed by end users (households, services, industries, transport and agriculture).

Non-interconnected territories (NITs) :

Refers to the French territories that are not connected to the continental electrical grid because of their geographical remoteness. There are Reunion Island, Guadeloupe, Martinique, French Guiana and Corsica.

PV :

Abbreviation for photovoltaic systems.

Penetration rate of renewable energies :

Share of renewable energies in the total power generation.

Primary energy consumption :

Primary energy consumption measures the total energy demand and covers consumption of the energy sector itself, losses during transformation and distribution of energy, and the final consumption by end users. The primary energy consumption allows measuring the energy independence rate.

Primary energy quantity necessary to produce 1 ktoe of final energy :

This is a conversion factor to get from electricity to primary energy. It is a coefficient allowing to add electricity to primary fossil energies in energy balances.

Rated capacity :

Net power output available on the power grid.

Ton of oil equivalent (toe) :

Energy unit equivalent to the energy released by burning one ton of crude oil. It is an energy unit that is used to compare the energy from different sources.

New Caledonia is a French special collectivity composed of islands and archipels that is not part of the NITs.



For more information, find out the technical energy balance (in French) on our website

Reunion Island Energy Observatory

The Reunion Island Energy Observatory, OER (Observatoire Energie Réunion), hosted by the company Horizon Réunion, is part of the energy strategy led by the regional council and the partners of the island's action on energy policy.

Observation and information tool regarding the energy state of Reunion Island, the observatory comes from the wish of the different partners to provide themselves with a specific instrument to support energy management actions and develop renewable energies as well as measuring the impact of these actions.

Horizon Réunion

Since 2013, the local public company Horizon Réunion has supported Reunion Island towards electric self-sufficiency, serving communities, territories and its inhabitants.

Formerly called Energies Reunion, the company changed its name on 12 February 2019, following the opening of its corporate purpose to new skills regarding the environment, biodiversity and climate. Its role: to support local authorities in the development of concrete projects regarding energy, solidarity and sustainability challenges.

Observatory's partners for 2014-2019 :



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