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## Agence Française de Développement

### Carbon dependency and tourism development in French overseas departments and territories

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## Summary

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## 1. Tourism and climate change: tourism greenhouse gas (GHG) emissions

Tourism affects and is affected by climate change. As a producer of greenhouse gases (GHGs), tourism has an impact on the environment. However, until recently, researchers and politicians rarely chose to focus on tourism's contribution to climate change. The link between tourism and climate change was examined using data from sectors contributing to tourism activity. This has led to a lack of information on the underlying trends influencing the tourism and leisure markets. Emission inventories or GHG limitation strategies rarely target tourism. And, while 80% of air traffic is due to tourist trips (DG Enterprise European Commission 2004, p.39), the Kyoto Protocol does not apply to air transport.

The Second International Conference on Climate Change and Tourism took place in Davos in September 2007. It saw the tourism sector's first attempts at estimating CO<sub>2</sub> emissions and radiative forcing on an international level. Evaluations took into account day trips as well as emissions from transport, accommodation and leisure activities.

Tourism's contribution to global CO<sub>2</sub> emissions is estimated at around 4 to 6%. Its contribution to radiative forcing, a measure better suited to air traffic, is between 4.4 and 14.3% with maximal cirrus activity (itself a contested topic). Origin-to-destination transport accounts for 75% of tourism's CO<sub>2</sub> emissions, with accommodation and tourist activities responsible for a further 21 and 4% respectively. In international tourism, air travel contributes 86% of CO<sub>2</sub> emissions (UNWTO).

Most air traffic is between developed countries (for instance, between Europe and North America). However, long-haul trips are also an important source of emissions, regardless of the destination. In France, for example, an average of 65kg of CO<sub>2</sub> is produced for each domestic trip, compared to 3270kg for trips to French overseas departments and territories and up to 4 tonnes for trips to the antipodes (TEC, using data from SDT<sup>1</sup> and ADEME<sup>2</sup> coefficients).

Long-haul tourism destinations are facing uncertain futures, a factor that must not be overlooked in discussions on tourism and climate change. This is especially true given tourism's importance in destinations off the beaten track (including island nations) and the high hopes placed in tourism as a means of encouraging development (UNWTO 2004).

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<sup>1</sup> *Suivi des déplacements touristiques des Français (SDT)*: French tourism travel monitoring

<sup>2</sup> *Agence de l'environnement et de la maîtrise de l'énergie (ADEME)*: French Environment and Energy Management Agency

For French overseas departments and territories, this is an important problem, even if tourism is not as essential to their economies as it is in other, poorer destinations. The most significant change is in the target market: currently, metropolitan French visitors are common, with historical ties (political, linguistic and familial in nature) proving more important than distance. The political status of these areas is also relevant. If considered a French overseas “department”<sup>3</sup>, the region’s emissions are included in France’s emission totals: flights between the destination and metropolitan France are considered “domestic”, and therefore covered by the Kyoto Protocol. For French overseas “territories”, the situation is different, but may be affected by post-Kyoto agreements.

## 2. What does the future hold? Emissions, science and politics

To avoid dangerous climate change, “stabilisation” scenarios have been developed identifying appropriate emission levels and targets. The IPCC has also investigated the potential effects of temperature rises, a useful step in estimating how dangerous these changes may be (IPCC 2007). The risks have led the European Union to set a climate change target limiting temperature rises to below 2°C compared to the pre-industrial era. Given the temperature rises already experienced, the EU only has a 1.4° margin for manoeuvre. This figure can be used to estimate the cost of different emissions targets in decades to come. Recent studies have shown that global emissions must be reduced by 80% by 2050 if this objective is to be attained with more than 50% certainty. These figures are more ambitious than those previously published: to reduce global emissions by 50%, a developed country like France must reduce its emissions by 75%. Furthermore, recent developments in the scientific field mean that the “Factor 4” objective (achieving a fourfold reduction in GHG emissions) may no longer be sufficient (Radanne 2004).

Currently, national emissions reduction targets are set by the Kyoto Protocol. Using 1990 emissions figures, reduction targets are based on differentiated responsibility. Only some developed countries (called “Annex 1 parties”) have committed to binding targets (with the notable exception of the United States). Emerging countries (like India, Brazil and China) and developing countries have not yet committed to binding targets.

Follow-up initiatives to the Kyoto Protocol are already underway. These include negotiations on sharing the emissions reduction burden among countries and encouraging more countries to make binding commitments. These activities must be completed by the end of 2009, when the Copenhagen Conference will take place. There is no evidence that the targets defined above will be met.

Given this study’s focus on aviation, the importance of air travel in the negotiation process must be discussed.

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<sup>3</sup> Translator’s note: French overseas departments and French overseas territories are different political entities. French overseas departments are considered part of metropolitan France, a status with legal and other implications.

## CARBON DEPENDENCY AND TOURISM DEVELOPMENT

The Kyoto Protocol differentiates between domestic and international flights. While domestic flights are covered by the agreement, international flights are not. From an emissions point of view, this situation must be remedied as soon as possible.

International flights were originally excluded from the Protocol because of difficulties in establishing who was actually responsible for emissions (options included the origin, the destination, both origin and destination, or the airline's home country). It was also feared that the Protocol would cast doubt on many bilateral air traffic agreements in force. Nevertheless, some groups of countries, including the European Union, have adopted economic measures to reduce emissions (in the form of negotiable quotas), depending on the actions available to them on the international level.

The future is uncertain. Airlines have accepted the principle of carbon trading schemes. They could therefore purchase emissions quotas from other market sectors, and implement the compensation measures set down in the Kyoto Protocol (Clean Development Mechanisms or CDMs). In line with the "common but differentiated responsibilities" principle, different regimes could be applied to different itineraries, depending on whether developing or emerging countries were involved. Some solutions include exemptions or temporary concessions. For airlines, this scenario depends on continued growth, which is likely given the industry's low price elasticity and ability to pass costs onto consumers. However, airlines strongly oppose an industry-specific emissions trading scheme (UNWTO 2009).

Given the context, this study aims to:

- Estimate current GHG emissions caused by tourism to French overseas departments and territories;
- Measure emissions against tourism activity, thus calculating the sector's "eco-efficiency" by comparing:
  - Different target markets,
  - Tourism with other economic activities; and
- Draft strategies to deal with the carbon constraint by identifying variables that affect emissions (including, for example, customer profiles and length of stay) and using them to develop scenarios up to the year 2025.

## ***Methodology: research and scenarios***

### **1. Data sources**

#### **1.1 Tourism flows**

For tourism data, we used statistics produced by INSEE<sup>4</sup> (French National Institute for Statistics and Economic Studies) for French overseas departments (Guadeloupe, Martinique and Reunion Island). We also used data from local statistical departments: the French-Polynesian Statistical Institute (Institut de Statistiques de Polynésie Française or ISPF) for French Polynesia, and the Institute for Statistics and Economic Studies (Institut de la Statistique et des Etudes Economiques or ISEE) for New Caledonia.

Further information on air traffic flows was sometimes obtained from chambers of commerce and industry charged with managing airports.

Data included arrivals, overnight stays, length of stay, and expenditure. Information was collated in table form and ranked by origin and submarket (using categories like business, family and pleasure).

Economic data was taken from annual activity reports published by the French overseas department and territory currency emission institute (Institut d'émission d'Outre-Mer or IEOM).

#### **1.2 Tourism emissions**

As mentioned above, origin-to-destination transport is responsible for most GHG emissions in the tourism sector – up to 75% globally. For destinations that are off the beaten track, this figure can rise to 90%. Given their geographical locations, most of the regions in this study rely almost totally on air transport for tourist arrivals. As a result, most emissions can be calculated using statistics on tourist arrivals and the resulting air traffic, regardless of other aspects of stays – like whether they incorporate a cruise (cruise ships being high emissions producers). Fortunately information on air traffic flows (including origin and distance travelled) is very precise, as are emissions coefficients for the number of passenger kilometres (ADEME, for instance, distinguishes between short, medium and long-haul flights). It would have been very difficult to estimate (domestic) non-aviation transport emissions, given the lack of data on tourism flows on the one hand, and accommodation on the other (emissions caused by accommodation are subject to much debate and can vary widely).

The GHG emissions analysed in this study include those produced as a result of international tourism transport (whether for business, family or pleasure reasons). Emissions not analysed include trips by residents (for tourism, health or business). Also excluded are

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<sup>4</sup> Including the EFT: Enquête sur les Flux Touristiques (survey of tourism flows), EDT: Enquête sur les Données Touristiques (survey of tourism data) and EFH: Enquête sur la Fréquentation Hôtelière (survey of accommodation occupation rates).

trips at the destination (except in French Polynesia, where island-to-island transport is examined), and emissions produced by accommodation or leisure activities.

### 1.3 Emissions from other sectors

Comparing tourism emissions to those of other sectors depends on the availability of data. Not all French overseas territories or departments produce industry-specific emissions inventories. Where inventories are lacking (as in Reunion Island), statistics produced in other reports may be useful (for instance, in prospective studies or energy inventories). However, the scope of this information may be limited, and it may be based on doubtful calculation methods or definitions (for example, in terms of which emissions coefficients are used). In some regions, no emissions data is available. Inevitably, these discrepancies restrict the scope of our analysis.

## 2. Eco-efficiency

Eco-efficiency is a measure used to balance the wealth created by an activity against damage caused to the environment. Not only does it facilitate comparisons between different commercial activities and development strategies, it also enables us to contrast different branches or production techniques within the same sector. The concept of eco-efficiency and tourism was first discussed in a ground-breaking article in Ecological Economics (Gössling, Peeters et al. 2005). The article focused on one form of ecological damage: GHG emissions.

Eco-efficiency is measured by ratios. In the current study, we have used the traditional GHG emissions (CO<sub>2</sub>-e)/value added ratio, as well as CO<sub>2</sub>-e/overnight stay and CO<sub>2</sub>-e/inhabitant ratios. The latter examples provide useful information for identifying strategies to improve well-being or reduce GHG emissions per inhabitant.

## 3. Rough data

Tourism data was organised using Excel spreadsheets.

The horizontal labels were used for originating markets, with more or less detail depending on available data. Regions supplying the most tourists were presented in as much detail as possible (using all or a selection of the originating countries). For Guadeloupe, information on French metropolitan tourists even distinguishes between different regions in France. The differing level of detail meant that horizontal labels were not identical from destination to destination. Where possible, horizontal labels have further been divided in line with the purpose of stay (including tourism, business, family, and honeymoons).

Vertical labels included:

- Arrivals
- Overnight stays
- Expenditure (per person, per day, and overall)
- Distance travelled
- Emissions coefficients

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- Total CO<sub>2</sub>-e for each market segment

Eco-efficiency calculations gave three sets of data:

- CO<sub>2</sub>-e per euro (€) spent
- CO<sub>2</sub>-e per stay
- CO<sub>2</sub>-e per overnight stay

Comparisons between tourism and other activities varied widely from destination to destination. Each data table was therefore different.

### 4. Projections

To examine how the carbon constraint will affect tourism in the regions concerned by this study, we developed scenarios.

These scenarios were based on the Excel spreadsheets described above, with modifications to incorporate data not included in the original databases. Parameters were modified to analyse their effect on tourism variables using:

- Different hypotheses on emissions regulation, and their effect on metropolitan France and French overseas departments and territories. These hypotheses were developed with regard to recent studies by IPCC researchers, international commitments (like those made by the European Union) and the post-Kyoto negotiation process (especially in the aviation field).
- Different hypotheses on the tourism sector in each of the regions concerned.

These projections cannot be considered a prospective study, as a prospective study is based on hypotheses developed through discussion with local stakeholders. Our projections focus on manipulating different parameters, using expert knowledge as well as scientific literature and reference works on the subject (ordinarily insufficient for a well-planned prospective study). Nevertheless, these projections do give some idea of what the future holds.

The projections are based on data obtained for each territory. They end in the year 2025 and use the European regulatory environment. This gave two kinds of scenario:

- A “benchmark” scenario, generating a 40% drop in emissions and an increase in tourism expenditure. This scenario used basic parameters like distance travelled, expenditure, length of stay, but also more complex parameters like passenger load factors, emerging markets and even passenger routing to reduce flight distances. These parameters were analysed and modelled to obtain the desired results.
- A “territory-specific” scenario, taking into account, for example, Reunion Island's Tourism Development Plan (*Schéma d'Aménagement et de Développement Touristique*) and New Caledonia's nickel industry.

Results for each territory were compared against those for other territories and metropolitan France. Strategies were identified for tourism development in French overseas territories and considered in the light of international developments in the field of climate change and GHG restrictions.

## CARBON DEPENDENCY AND TOURISM DEVELOPMENT

The next section provides a comparative analysis of results obtained for all the territories examined, as well as the main solutions identified.

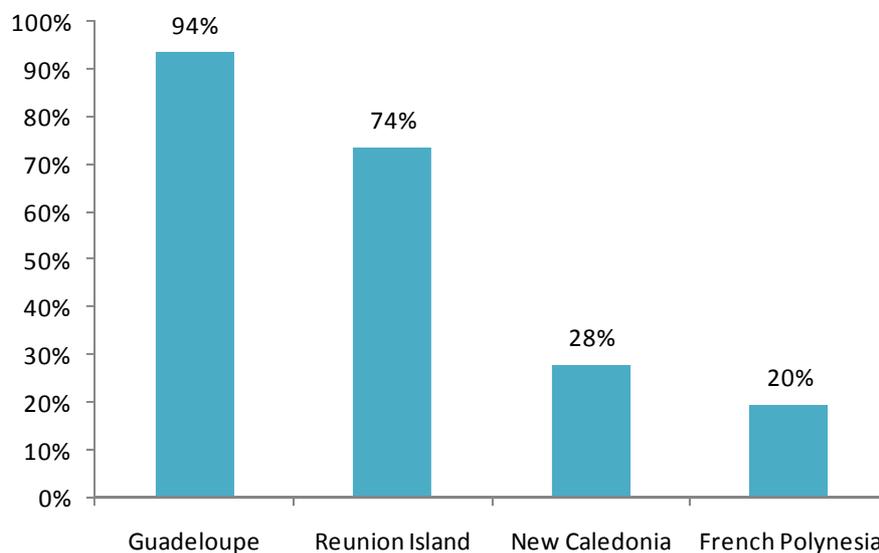
## I. Tourism eco-efficiency

### 1. Challenges for tourism in French overseas territories

#### 1.1 Visitors from metropolitan France

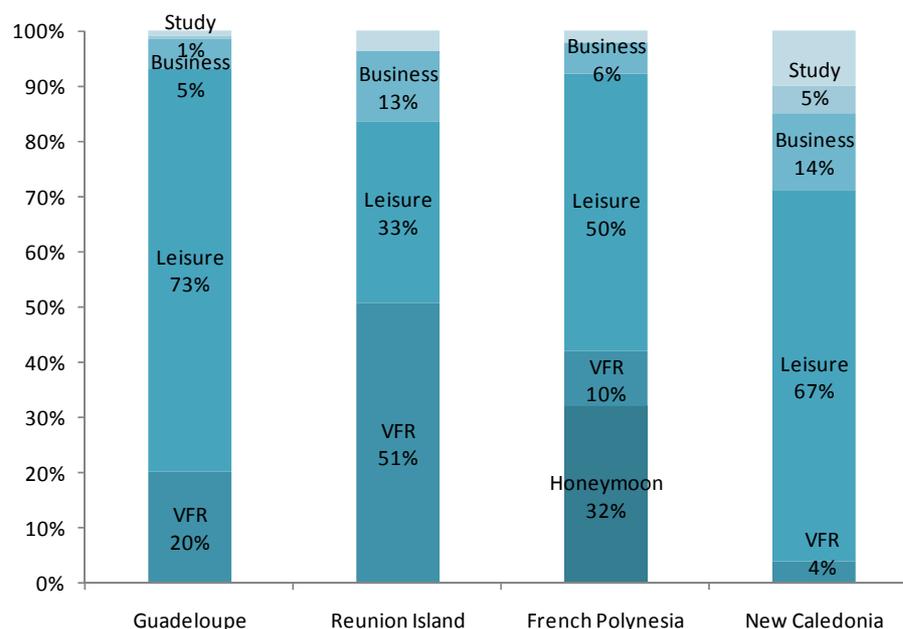
Tourism differs in each of France's overseas departments and territories. Tourist arrivals can double from one destination to another. The French West Indies, for example, attract by far the most tourists. Nevertheless, there is one underlying trend: French overseas territories and departments are all dependent on visitors from metropolitan France to some extent. They can therefore be divided into two groups: destinations with a development strategy focusing on new markets, and destinations heavily dependent on French visitors. Isolated destinations like French Polynesia and New Caledonia are open to the Asia-Oceania and American markets, while destinations like the French West Indies and Reunion Island are heavily dependent on the French market. Many metropolitan arrivals visit these destinations for family reasons, which increases VFR (visiting friends and relatives) traffic. With less metropolitan visitors, French Polynesia and New Caledonia have a more diverse visitor base, which travels for a range of reasons, as seen in Figure 1.

**Figure 1: Percentage of Metropolitan arrivals (2007)**



Sources: TEC, Insee, ISPF, ISEE

**Figure 2: Visitors by sub-market (2007)**



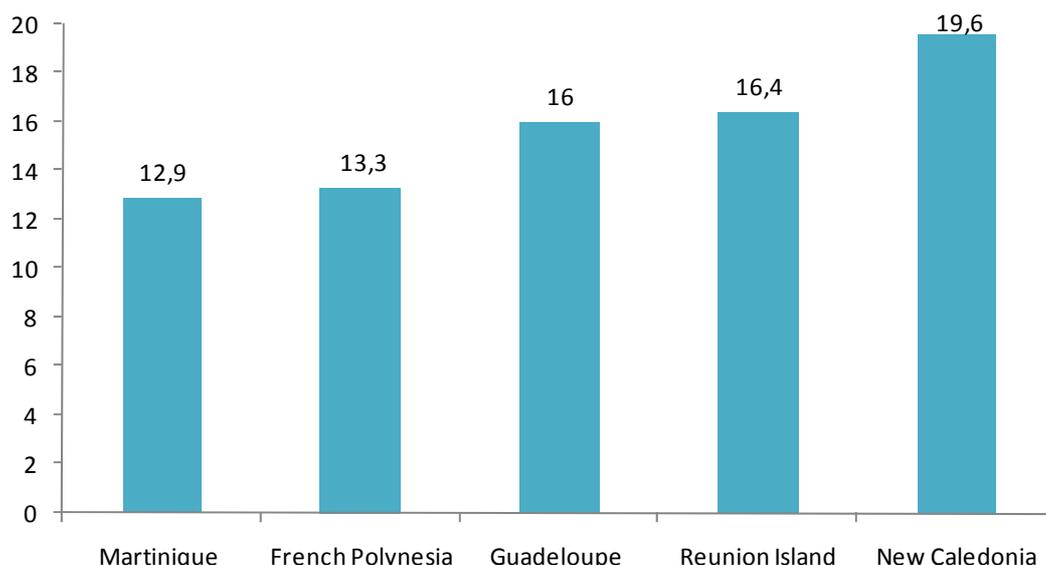
Source: TEC, using data from Insee, ISEE and ISPF

As seen above, VFR (visiting friends and relatives) traffic is a source of regular visitors for most destinations. However, VFR visitors exacerbate seasonal variation, travelling mostly during holiday periods. They also spend less than other types of tourists, generally staying with friends or family. Pleasure tourism is another important sub-market for all destinations. Business tourism only accounts for around 5% of visitors, except in Reunion Island and New Caledonia where other economic activities (information technology activities and nickel mining respectively) attract companies. French Polynesia stands out for its honeymoon sub-market, which represents a third of all visitors. In general, destinations with varied target markets are more likely to have more developed sub-markets and are less subject to seasonal peaks.

### 1.2 Long stays but variable expenditure patterns

The average length of stay (LOS) in French overseas departments and territories is relatively long. This is due to high levels of VFR traffic and the number of visitors from metropolitan France. LOS appears to be determined by the type of stay, rather than the distance travelled or product on offer.

**Figure 3: Average length of stay (LOS) by territory in 2007**

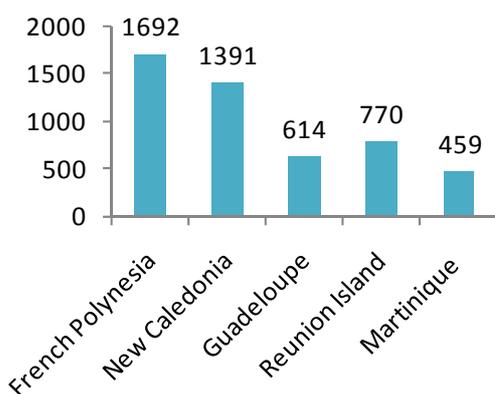


Source: TEC, using data from Insee, ISEE and ISPF

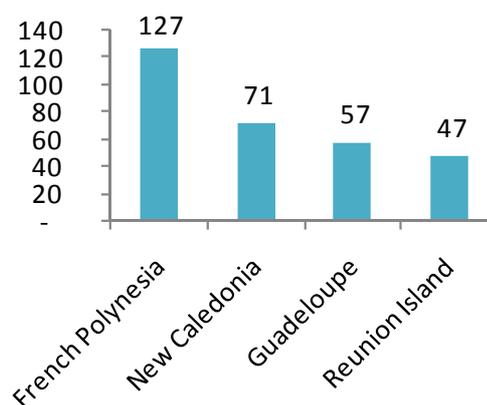
Tourist expenditure varies significantly from destination to destination. French Polynesia, for example, focuses on high-end visitors. As a result, the average tourist spends € 1692 per stay, or € 127 per day<sup>5</sup>. Meanwhile, Guadeloupe focuses on mid-range resort tourism. The average visitor spends a total of € 600, or € 45 per day. Finally, in New Caledonia, a well-developed business tourism sub-market pushes visitor expenditure up to € 71 per day.

**Figure 4: Visitor expenditure in French overseas departments and territories (in €) in 2007<sup>6</sup>**

Per tourist per stay



Per tourist per day



Source: TEC, using data from Insee, ISEE and ISPF

The graph below gives further insight into visitor expenditure trends. French visitors, for example, usually outnumber American, Japanese or other European visitors. Nevertheless,

<sup>5</sup> Excluding flight costs to the destination.

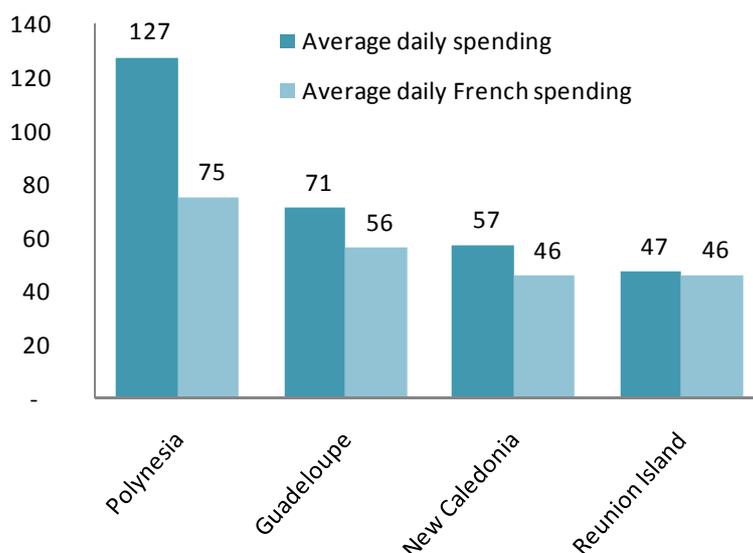
<sup>6</sup> Results obtained by dividing total expenditure by number of arrivals / number of bed nights.

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they spend less, as can be seen by comparing average daily expenditure with French average daily expenditure. This gives rise to two conclusions:

- In French Polynesia and New Caledonia, French visitors spend considerably less than the average.
- In Guadeloupe and Reunion Island, French visitors spend close to the average. This is due to the high proportion of French visitors (95% in Guadeloupe and 75% in Reunion Island).

**Figure 5: Comparison of French visitors' daily expenditure and average daily expenditure.**



Source: TEC, using data from Insee, ISEE and ISPF, 2007

The economic benefits of tourism are better developed by diversifying target markets. In particular, this allows destinations to attract visitors who spend more.

### 1.3 Risks for tourism

#### Sluggish growth

Between 2000 and 2005, tourism to French overseas territories and departments fell significantly. After the events of September 11,<sup>7</sup> arrivals dropped, hotel occupation rates worsened, air traffic decreased and, at times, so did revenues. However, while the repercussions of September 11 were global, the crisis affecting French overseas territories and departments appeared to be local. In 2007, for example, statistics show that tourism to New Caledonia was only 1% of total tourism to Oceania. In the same year, tourism to French Polynesia was only 2% of total tourism to Oceania. Meanwhile, the Pacific Asia Travel Association reported a 15% increase in tourism to the Pacific-Oceania zone

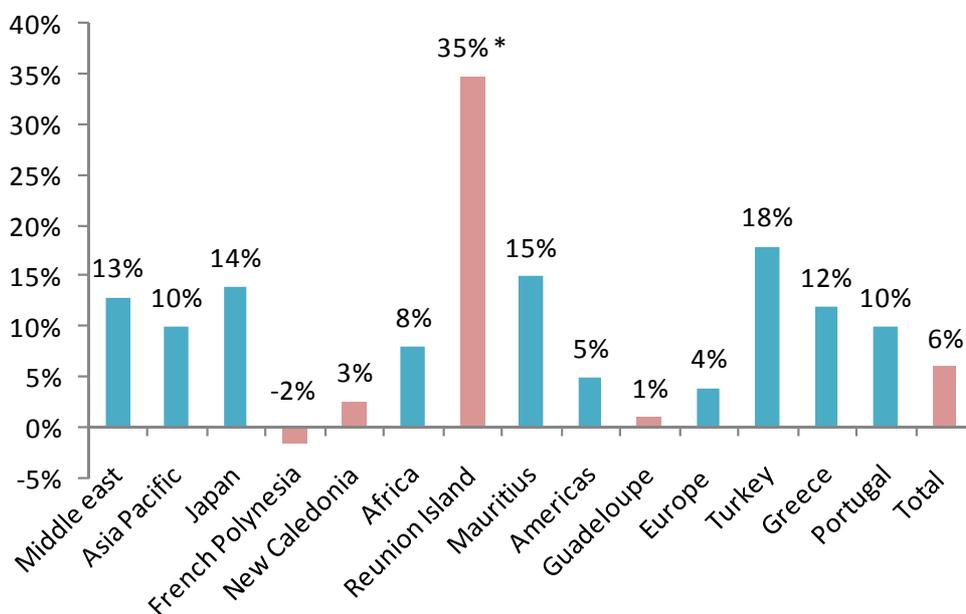
<sup>7</sup> The attacks on the World Trade Towers caused a decrease in international travel in 2001 and 2002.

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between 2000 and 2007. Over the same period, tourism to French Polynesia and New Caledonia dropped around 6%.<sup>8</sup>

The table below presents different growth figures for 2007. Unable to capture new tourism markets, French overseas territories and departments lag behind the industry average.

**Figure 6: Tourism growth by zone (2007)**



Source: TEC, UNWTO 2007

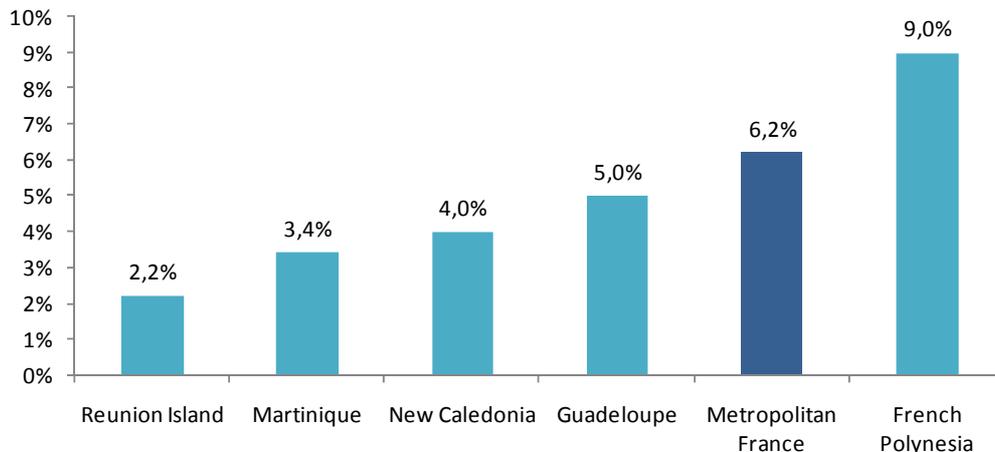
### Importance of tourism revenues

Earnings from tourism vary from one destination to another. To identify tourism's relative importance to local economies, we chose to divide tourism revenues by total local revenues. The results showed how important tourism is in French overseas territories. In French Polynesia, it contributes 9% of the local GDP and, in Guadeloupe, 5%. In French overseas departments, however, tourism is less important, and counterbalanced by transfer payments from metropolitan France.

<sup>8</sup> Cf. Annex 1

\* Reunion Island's 35% increase in tourism was due to tourist arrivals picking up after the 2006 crisis caused by the Chikungunya epidemic.

**Figure 7: Tourism as a percentage of local GDP in French overseas territories and departments (2007)**



Source: TEC, using data from Insee, ISEE and ISPF

When tourism makes up a significant part of local GDP, this suggests a heavy dependency on tourism revenues. Adapting to fluctuations in the market is therefore more difficult, and crises more likely.

### Vulnerability to crises

Their tropical location makes French overseas departments and territories particularly vulnerable to natural disasters and health emergencies. Their unique socio-economic context can also affect tourism.

Some recent crises include:

- Economic upheavals in the Pacific zone: 11 September 2001 and the Japanese economic crisis in 1998.
- The Chikungunya epidemic on Reunion Island in 2004.
- Cyclone Dean (2007), strikes (2009) , and a Dengue fever outbreak (2009) in the French West Indies

### Outdated growth strategies

Despite being geographically isolated, French overseas departments and territories share many characteristics. Tourism generally took off in the 1970s and 1980s, replacing less dynamic industries like agriculture, and was promoted to allow destinations to become more economically independent. Today, tourist products vary, but all rely on exoticism and the French metropolitan target market. The industry's limits appear to have been reached: products lack innovation and arrival statistics are falling. Destinations are struggling to develop strategies that set them apart from the crowd.

Tourism development plans can help to outline clear strategies. Reunion Island is the only destination to have developed a tourism development plan. To the best of our knowledge, however, it has not yet been ratified. In other regions, it is only possible to identify general trends, using project documents from contracts between these areas

and metropolitan France covering the 2007-2013 period. The strategies that have been developed are usually reactive rather than proactive. This was the case for Guadeloupe's strategy in reaction to the 2009 strikes and Reunion Island's strategy in reaction to the Chikungunya epidemic.

Growth strategies are also outdated. Focusing on quantity rather than quality, they often only mention the environment in passing and leave climate change completely out of the equation.

The tourism industry needs change: a marketing rethink is essential. Destinations must develop new products that take into account new industry constraints, including climate change.

## 2. Air transport

### 2.1 Distance to target market

What sets French overseas departments and territories apart is their distance from France. However, being distant from France does not make them distant from other potential markets.

Only French Polynesia is really geographically isolated. New Caledonia is relatively close to Asia and Oceania, and the French West Indies are close to Central America and the south-east United States. Reunion Island's situation is unique: geographically, it is close to Africa. However, given that most African economies are underdeveloped, Reunion Island can still be considered as geographically distant from potential markets.

The destinations' main source of tourism arrivals is France. France is 6,500km from the Antilles, 9,000km from Reunion Island and over 15,000km from New Caledonia and French Polynesia. Inevitably, all destinations depend on air transport. The destination sheets below identify the most efficient markets in terms of GHG emissions to allow decision-makers to develop alternative strategies should CO<sub>2</sub> emission reductions become compulsory. The focus should be on building marketing strategies targeting clients that spend generously but generate the least possible GHG emissions. This will be further developed in the "Strategies for Change" section.

### 2.2 High costs, low competitiveness

Airline access to French overseas territories is not a simple matter, and all destinations face a similar situation. The national airline, Air France, initially flew to all destinations. When its monopoly ended in the 1980s, however, each destination created its own local airline: Air Austral (in Reunion Island), Air Caraïbes (in the French West Indies), Air Calédonie (in New Caledonia), and Air Tahiti Nui (in French Polynesia). After Air France was privatised, it focused on more profitable services. Meanwhile, the development of local airlines was possible, mainly because of subventions from local authorities.

### 2.3 Air traffic dependency

As islands, all the destinations in this study rely on air transport to link them to the outside world. Residents must take the plane when they wish to travel, which is more expensive than other means of transport. To allow them to travel to metropolitan France, the French government began offering subsidies. This is known as the *continuité territoriale* or territorial continuity system. It allows residents to avoid price rises caused by increasing tourism. As tourism reinforces seasonal peaks, ticket prices often rise over holiday periods, making it difficult for residents to return home for the holidays. The territorial continuity system does have disadvantages for tour operators: making cheap tickets available to residents reduces the number of places available for tourists. Large-scale tourism is therefore impossible, especially in Reunion Island where business tourism predominates.

**Figure 8: Airline access to destinations by territory**

Territory	Population	Number of companies	Number of passengers + cargo (in passenger equivalent) <sup>10</sup>	Load factor	Tourist arrivals	Ticket price ex France <sup>11</sup>
Guadeloupe	450 600	6	Pax: 1 000 000 Cargo: NC	NC.	417 000	918 - 2865
Martinique	398 000	6	Pax: 800 000 Cargo: 65 500 pax eq. <sup>12</sup>	NC.	500 000	880 - 3552
New Caledonia	240 000	6	Pax: 220 000 Cargo: 28 125 pax eq.	68% environ	108 000	1685 - 3693
French Polynesia	260 000	7	Pax: 660 000 Cargo: 45 000 pax eq. + domestic Pax: 830 000 Cargo: 11 000 pax eq.	72.6 % De 54,1 à 83,6	218 000	2886 - 5387
Reunion Island	793 000	5	820 000 pax Cargo: NC	NC.	380 000	1262 - 3458

Source: TEC, CCI

### 2.4 The right price

Ticket prices are currently rising, despite the authorities' efforts to keep them at a "reasonable" level, "reasonable" being a compromise between maintaining territorial

<sup>10</sup> Arrivals

<sup>11</sup> Price in Euros on Air France ex Paris (economy class / business class).

<sup>12</sup> 10 500 tonnes imported (14 000 tonnes in total).

continuity and allowing the development of a profitable tourism sector. In real terms, tickets to the French West Indies increased 28% between 1998 and 2003, and tickets to Reunion Island increased 25% over the same period. The drop in tourism has also led tour operators to offer “package deals”, including accommodation and air travel. Flights in these packages are very cheap compared to normal flights, which explains residents' frustration.

**Figure 9: Evolution of average Air France ticket prices for the French West Indies and Reunion Island between 1961 and 2002.**

**ÉVOLUTION DU PRIX MOYEN DU BILLET  
(VENDU PAR AIR FRANCE) POUR LES ANTILLES**

*(en euros constants)*

1990-1998	1998-2003	1990-2003
-37 %	+12 %	-25 %

**ÉVOLUTION DU PRIX MOYEN DU BILLET  
(VENDU PAR AIR FRANCE) POUR LA RÉUNION**

*(en euros constants)*

1990-1998	1998-2003	1990-2003
-39 %	+8 %	-31 %

Source: Direction Générale de l'aviation Civile<sup>13</sup>

Ticket pricing for residents and tourists is therefore a delicate exercise, and one that involves balancing politics and fairness. Traditional airlines use a marketing mix to set an average required price for the flight to be profitable. Some tickets are more expensive (such as business or first class tickets), and other tickets are less expensive (such as economy class tickets). In French overseas destinations, however, there is very little demand for business class tickets. To be able to offer less expensive tickets, then, some passengers must pay more than others. If tourists are systematically required to pay more, this will limit tourism development potential. At the same time, making residents pay more is unacceptable for socio-economic reasons. This creates a no-win situation: half empty flights and compulsory subsidies make flights unprofitable and environmentally damaging.

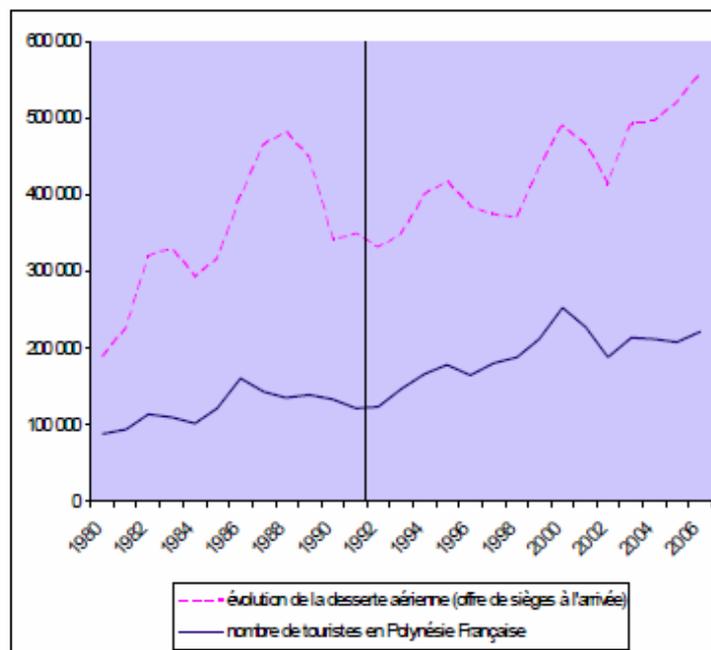
**2.5 Tourism and air traffic**

Tourism development depends on air traffic. As shown in the graph below, there is a direct relationship between the number of flights and tourist arrivals. This shows the impact of structural measures put in place by the authorities.

<sup>13</sup> In “Rapport d'information sur la desserte aérienne de l'outre-mer” (report on air traffic to French overseas departments and territories), n° 1454, presented by M. Beaugendre to the French National Assembly on 25 February 2004.

**Figure 10: Correlation between airline seats and tourist arrivals in French Polynesia**

*Nombre de touristes et desserte aérienne en Polynésie de 1980 à 2006*  
 Source : Air Tahiti Nui



Source: Air Tahiti Nui

Flights to French overseas departments and territories generally leave from Paris' Orly Airport, like most "domestic" French flights. Destinations have argued that departures from Paris' Charles de Gaulle Airport would be preferable, because of its international connections with other European countries.

In addition, initiatives to increase air traffic have been put in place, including:

- Tax exemptions : tax credits for investment, in particular for air travel;
- FIATA (intervention fund for airports and air traffic) subsidies: land development grants where flights are part of a public service delegation (since 1995);
- Social support: authorised by the European Union for some demographic groups, or even entire populations;
- Subsidised holidays for public sector workers;
- *Passeports mobilité* or mobility passports facilitating access by students in overseas territories and departments to French universities (since 2002);
- Territorial continuity allocations: financed by the European Union (33%), local authorities (33%) and France (33%), these allocations allow residents to purchase one return ticket per year at a 30% discount.

### 3. Eco-efficiency

Tourism to French overseas departments and territories is characterized by geographically distant target markets, close ties to France, and dependency on air travel for tourist

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arrivals. Tourism is therefore an important source of GHG emissions. This is especially true if results are compared with tourism to metropolitan France.

However, there are significant differences between the destinations and their perspectives for the future.<sup>14</sup> By using the concept of eco-efficiency to compare different economic activities, it is possible to identify more efficient development options, distinguishing between different products, sectors and means of production.

### **3.1 Eco-efficiency: expenditure and length of stay (LOS)**

The eco-efficiency results in

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<sup>14</sup> Results for each territory are available in individual presentations, [available at](#)

Figure 11 highlight several different trends. New Caledonia obtained the best results, with a score of 3.61 kg CO<sub>2</sub>/Euro spent. It was followed by French Polynesia, with 4.24 kg CO<sub>2</sub>/Euro spent. Reunion Island and the French West Indies, with high levels of VFR tourism and average expenditure, score respectively 6.52 and 6.87 kg CO<sub>2</sub>/Euro spent. In these two destinations, average eco-efficiency is close to the worst eco-efficiency result obtained: evidence of the predominance of French tourists and their low average expenditure. The best eco-efficiency results are obtained by combining high tourist expenditure with upmarket tourist products (luxury and business tourism). Even then, results still compare unfavourably with those of metropolitan France: 2.10 kg/Euro spent. Future tourism strategies for Reunion Island and New Caledonia will therefore need to focus on building new target markets (that are closer and that spend more), and modifying existing ones.

In Table C, eco-efficiency per overnight stay, New Caledonia maintains its first place behind metropolitan France. It is therefore the most eco-efficient destination, in terms of both expenditure and overnight stays. Reunion Island follows, with its eco-efficiency affected by predominantly French tourist arrivals and a relatively short length of stay that is insufficient to compensate for air transport GHG emissions. French Polynesia is next. Despite more diverse markets, the destination is unable to compensate for its geographical isolation. The average LOS is too short to outweigh GHG emissions during transport.<sup>15</sup>

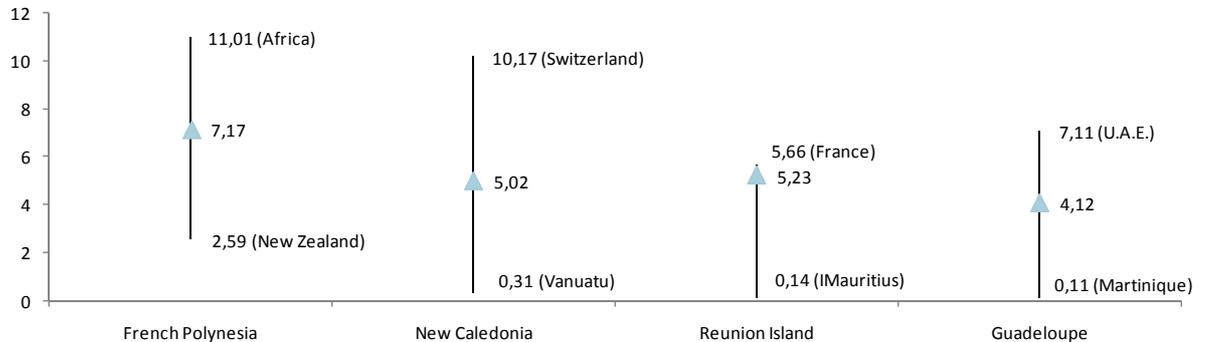
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<sup>15</sup> We were unable to obtain detailed information on overnight stays by originating market for the French West Indies.

**Figure 11: Tourism eco-efficiency in French overseas departments and territories**

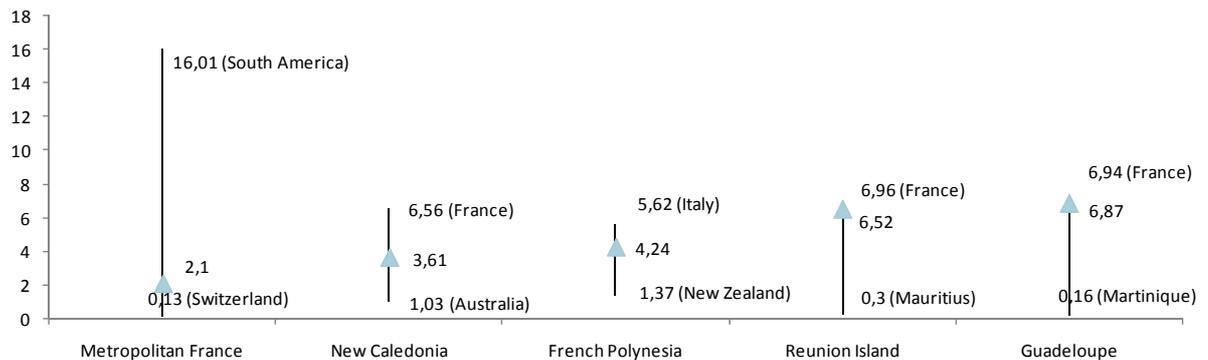
For each destination, the range of possible eco-efficiency scores and the average eco-efficiency score are presented.

a. Tonnes of CO<sub>2</sub>-e per stay



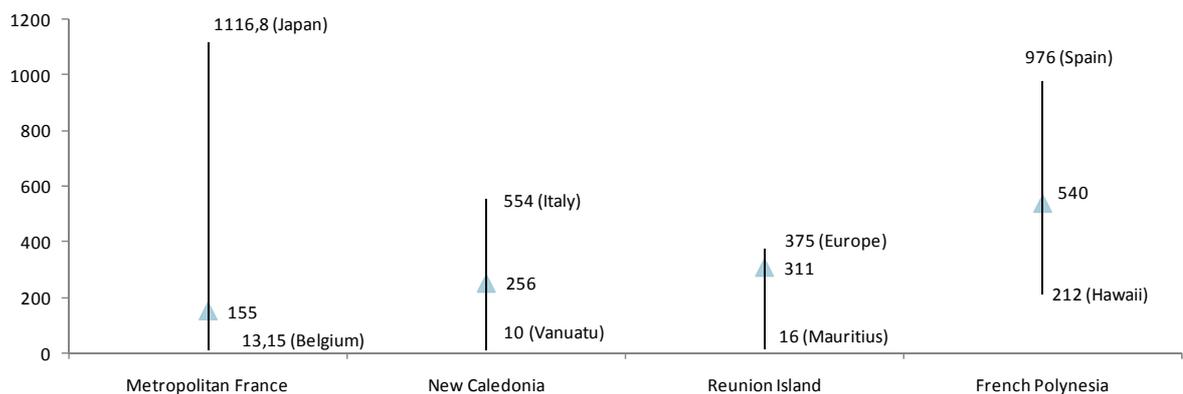
Source: TEC, using INSEE data

b. Kilograms of CO<sub>2</sub>-e per Euro spent



Source: TEC, using data by eCLAT/INSEE

c. Kilograms of CO<sub>2</sub>-e per overnight stay



Source: TEC, using data by eCLAT/INSEE

### 3.2 Eco-efficiency: comparing results

#### Comparing results to other countries

Eco-efficiency results for French overseas departments and territories are very poor. This is because of the destinations geographical isolation and their dependence on air travel for tourist arrivals. This can be clearly seen in a comparison with eco-efficiency results for metropolitan France. As the world's first tourism destination, it attracts tourists from all over the world. Its primary source of tourists is, however, Europe, which explains its final average eco-efficiency score of 2.1 kg CO<sub>2</sub>-e/Euro spent. Nevertheless, two remarks must be made:

- Even with an eco-efficiency score of 2.10 kg, international tourism to metropolitan France risks being affected by GHG emission reduction targets;
- France scores just as badly as (and sometimes worse than) its overseas territories for long-haul visitors with low expenditure levels. For Latin America, for example, it obtains a score of 16.01 kg CO<sub>2</sub>-e/Euro spent.

**Figure 12 Tourism eco-efficiency by destination<sup>16</sup>**

<b>Tourism eco-efficiency by destination</b>	
	<b>CO<sub>2</sub>-e/Euro spent (kg)</b>
<b>Towards metropolitan France</b>	<b>2,10</b>
<b>Towards New Caledonia</b>	<b>3,61</b>
<b>Towards French Polynesia</b>	<b>4,24</b>
<b>Towards Reunion Island</b>	<b>6,52</b>
<b>Towards Guadeloupe</b>	<b>6,87</b>
<b>Towards Martinique</b>	<b>7,33</b>

Source: TEC 2009

In a concurrent study, "Tourist mobility: Socio-economic analysis and limitation strategies for tourism GHG emissions", we applied an alternative approach using data from different sources.<sup>17</sup> This obtained similar results.

<sup>16</sup> Eco-efficiency results for French overseas departments and territories are similar to those produced for similar destinations, including the Seychelles and a number of other destinations worldwide. Gössling, S., P. Peeters, et al. (2005). "The Eco-efficiency of Tourism." *Ecological economics* **54**: 417-434.

<sup>17</sup> Extracts from the study "Suivi des Déplacements Touristiques des Français" (SDT), which analyses tourist trips by French residents, to destinations in France, in French overseas territories and departments and other countries. Data on trips and stays, distance travelled and emissions coefficients enable the calculation of origin to destination transport emissions, as well as some eco-efficiency ratios like CO<sub>2</sub>-e/overnight stay or by stay.

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The processes used enabled us to produce detailed information on tourism from metropolitan France in each destination (a major source of tourism in the French West Indies, and a minor source of tourism in French Polynesia). What follows is a comparison of key results.

**Figure 13: Characteristics of tourist trips to French overseas departments and territories**

Total 2000-2007	Trips	Overnight stays	Distance travelled	Emissions	Emissions per overnight stay	Emissions per trip	Return distance
Units	Millions	Millions	Million km	Tonnes	Kg	Kg	Km
Guadeloupe	2,436	32,323	32896	7817796	242	3209	13503
Martinique	2,113	25,514	28882	7147051	280	3383	13670
Reunion Island	2,107	29,480	39442	9656921	328	4582	18715
French Guyana	0,201	2,812	2830	963073	343	4787	14067
French Polynesia	0,441	6,527	13780	3225770	494	7316	31252
New Caledonia	0,185	3,405	6164	1511818	444	8168	33303

Source: "GICC Le monde est à nous ? Analyse socio-économique des émissions de gaz à effet de serre dues aux déplacements de tourisme et de loisirs" (Tourist mobility: Socio-economic analysis and limitation strategies for tourism GHG emissions)

Tourist trips by French residents produce an average of 191 kg CO<sub>2</sub>-e per stay and 37 kg CO<sub>2</sub>-e per overnight stay. By comparison, trips to French overseas departments and territories produce between 3,209 kg CO<sub>2</sub>-e per stay and 242 and 494 kg CO<sub>2</sub>-e per overnight stay.

### Tourism eco-efficiency compared to other sectors

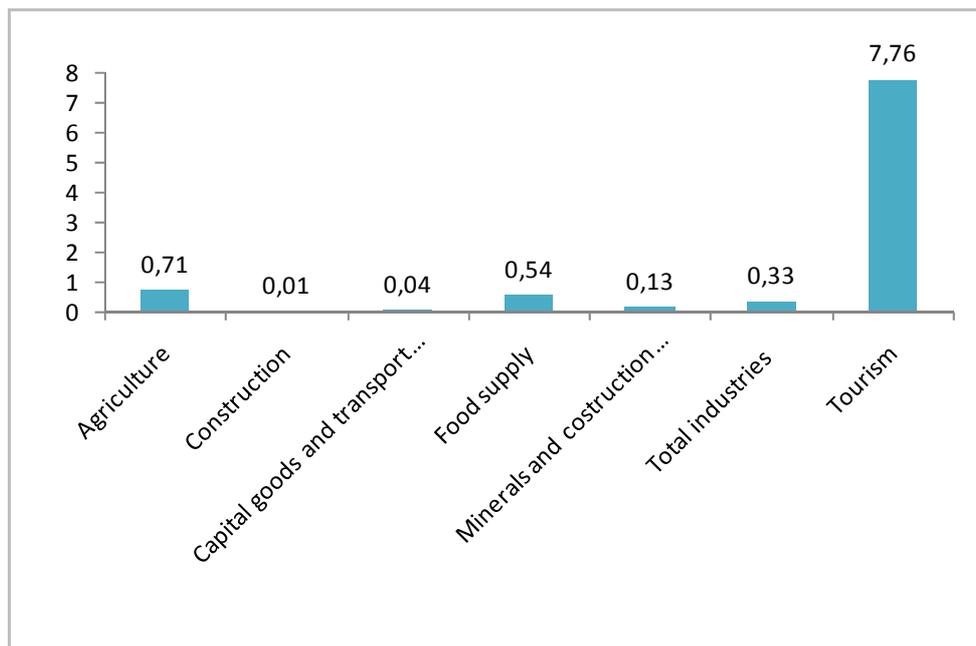
Each overseas territory or department has a unique socio-economic context. Calculations depend on data availability, which is seen in the differing results and information lacking for each destination.

French Polynesia, for example, does not have a *bilan carbone* or carbon inventory. Comparing eco-efficiency across different economic activities was therefore impossible.

In the French West Indies, we compared tourism with the industrial sector. The results showed that tourism contributed much more to climate change than other economic activities.

Similar results were obtained for Reunion Island. Eco-efficiency scores for tourism were much poorer than for other economic sectors. Most other activities obtained values of less than 1.00kg CO<sub>2</sub>-e per Euro of added value, while tourism scored a vertiginous 8 kg CO<sub>2</sub>-e per Euro of added value.

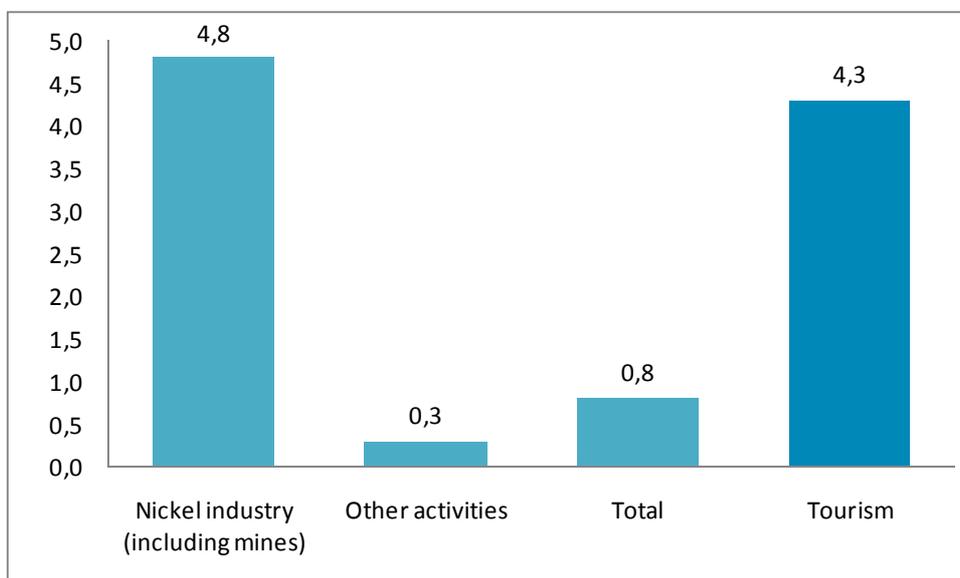
**Figure 14: Eco-efficiency by economic activity in Reunion Island**



Source: TEC

In New Caledonia, tourism was overshadowed by the nickel industry, which obtained a higher CO<sub>2</sub>-e/Euro of added value score.

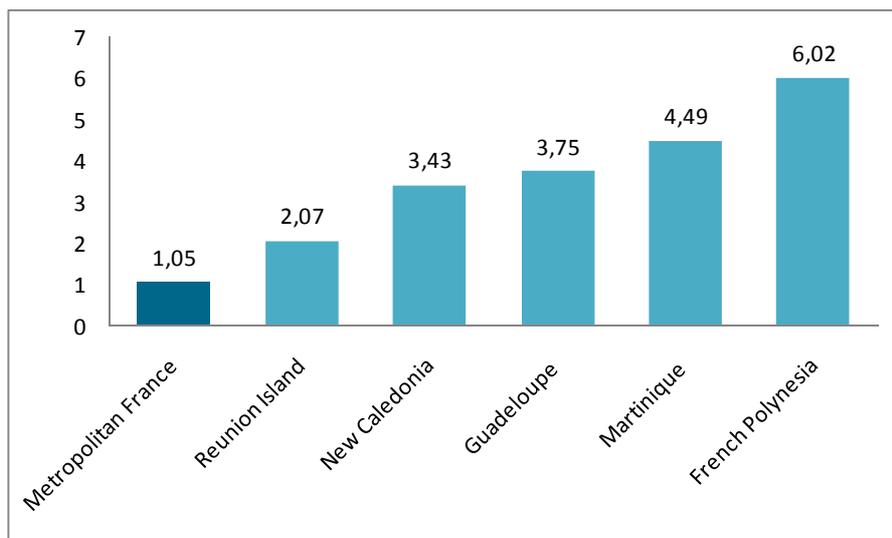
**Figure 15: Eco-efficiency by economic activity in New Caledonia**



Source: TEC

Eco-inefficient tourism is not only a problem for the tourism industry. It is also extremely important in managing territorial GHG emissions. Carbon inventories examine GHG emissions per inhabitant. As shown in the graph below, GHG emissions in French overseas departments and territories are between 2 and 6 times higher than metropolitan levels.

**Figure 16: Tourism GHG emissions by inhabitant in tonnes (2007)**



Source: TEC

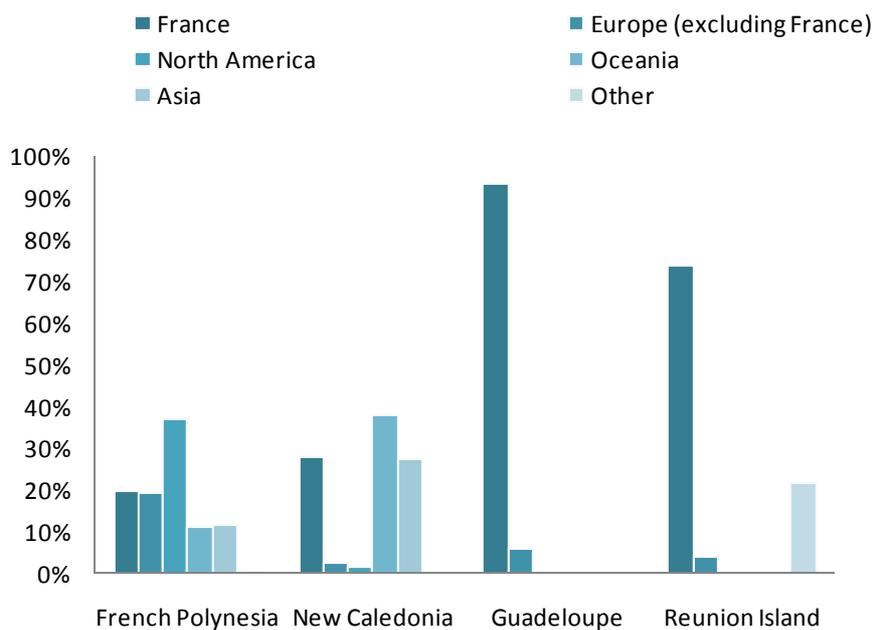
### 3.3 Developing alternatives: using eco-efficiency in strategy-building

#### Target markets

For most French overseas departments and territories, metropolitan France is the principal source of visitors. While this may not always be the most geographically distant market, it is often very far away: from 6,500 km for the French West Indies to over 16,000 km for New Caledonia. For destinations such as the French West Indies and Reunion Island where metropolitan visitors clearly outnumber other visitors, eco-efficiency scores are typically poor. In other words, the French market contributes to increased CO<sub>2</sub> emissions levels. The situation differs in French Polynesia and New Caledonia. Given their distance from metropolitan France, they have become more independent,<sup>18</sup> welcoming visitors of diverse origins.

<sup>18</sup> Unlike the French West Indies or Reunion Island, which are French overseas departments, New Caledonia is an overseas collectivity with a unique status, and French Polynesia is a French overseas country (*pays d'outre-mer*).

**Figure 17: Tourist origins for French overseas departments and territories (2007)**



Source: TEC, using data from INSEE, ISEE and ISPF

Most visitors to the French West Indies and Reunion Island are French. This has a negative effect on eco-efficiency scores. However, this dependency could be seen as an opportunity, and turned to their advantage. By identifying new target markets, these destinations could significantly reduce emission levels. This is especially true for the French West Indies, situated close to the central and north American markets. The situation is more complicated for Reunion Island, as its closest neighbours (India, the Middle East and Africa) are either less economically developed or geographically distant.

Meanwhile, geographic isolation has already forced French Polynesia and New Caledonia to develop alternative markets. With a focus on regional markets and more expensive tourist products, their eco-efficiency scores are much more positive. New Caledonia, in particular, has developed a business tourism market that generates high added value. Although French visitors still predominate, the island also attracts Australian and New Zealand investors, which decreases overall CO<sub>2</sub> emissions. New Caledonia's tourism industry is nevertheless the least developed of all the destinations studied, in terms of both earnings and visitor numbers. However, as one of several archipelagos, cruise ship tourism is on the rise, with each year bringing more visitors.

French Polynesia, on the other hand, has managed to develop several alternative markets. However, it remains the most geographically distant destination. Each tourist arrival generates significant CO<sub>2</sub> emissions. In this respect, "circuit" packages, allowing tourists to visit several islands, are just another source of CO<sub>2</sub>. To further improve eco-efficiency scores, the destination must increase overall tourist expenditure and length of stay, and focus on more "local" markets. More environmentally-friendly packages could be developed, such as holidays in one place rather than circuit packages, circuit

packages over shorter distances, or using sailboats rather than cruise ships as a means of transport.

### *Distance travelled*

French overseas departments' and territories' distance from current or potential markets varies. While substitute markets do exist, developing them is not always feasible. It would be interesting to define a "reasonable" distance for target markets, adapted to each destination. This would act as a kind of perimeter within which destinations could prospect for tourism. The "reasonable" distance would need to take into account destination-specific factors: while France, at 6,500 km from the French West Indies, is not a strategic target market, Australia, at 6,000 km from French Polynesia, is one of the destination's closest potential markets.

The French West Indies' closest market is clearly the American market: New York is 3,000 km away. Other potential markets include Central America, northern Latin America and the southern United States. Los Angeles is as far away from the French West Indies as Paris. Europe, currently the French West Indies' most important market, is around 7,000 km away, making it an undesirable option from an emissions point of view. Asia and Oceania are the most geographically distant.

Reunion Island is also relatively isolated. India is 6,000 km away. Africa is close, but only South Africa is developed enough to generate tourist flows. Australia, Asia and Europe are all around 9,000 km away. In this situation, eco-efficient markets need to be selected on the basis of other evaluation criteria, including overall expenditure and length of stay.

French Polynesia and New Caledonia are two very different examples. French Polynesia is geographically distant from all markets, the closest being the west coast of the United States and Oceania: Australia, New Zealand and other island nations. New Caledonia, on the other hand, is relatively close to Oceania and Indonesia, both around 2,000 km away.

The French West Indies and New Caledonia seem the best placed: the former because of its proximity to American markets and the latter because of its proximity to Oceania. French Polynesia is undoubtedly the most geographically isolated.

### *Other economic activities*

In the past, many studies underlined the need for "peripheral" territories to develop more independent and internally-focussed economies. French overseas departments and territories were no exception to this rule, although each faced a unique set of circumstances. In line with this view, tourism development was not a priority, as it encouraged dependency.

Two or three decades later, it is clear that destinations have not developed independent economies. Instead, tourism has grown considerably, pushed by the growth of wealth in metropolitan France and lower transport and energy costs. While tourism is important in all destinations, the level of dependency varies, as can be seen in Figure 7.

The international division of labour is now common. French overseas departments and territories, however, have been unable to attract international companies with

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inexpensive labour, because such working conditions would go against French law. Like metropolitan France, they can be considered both winners and losers in this respect. Trade liberalisation has also had a significant impact on traditional industries (such as banana exports). Consequently, these destinations are characterised by:

- Tourism-dependent economies, faced with increasing competition from other destinations;
- A decline in traditional activities and difficulty in adopting new ones;
- Dependency on transfers from metropolitan France that, while helping temporarily, do not encourage independent development initiatives: high transfer levels mean that tourism is often the most important “productive” sector, even if its contribution to local GDP is modest (9% in French Polynesia, for example).

Nevertheless, the situation varies between destinations. French Polynesia depends heavily on tourism, and traditional activities (including fishing and cultured pearls) are decreasing. It is difficult to identify alternative activities. The economy of the French West Indies also depends largely on tourism.<sup>19</sup>

New Caledonia, on the other hand, has a well-developed nickel industry. It could focus completely on nickel and associated activities, and bypass tourism (except business tourism associated with the nickel industry).

The situation in Reunion Island is different again. Tourism only accounts for 2.2% of local GDP. While labour is relatively expensive compared to emerging countries, the destination has many points in its favour. With a dynamic population, a strong culture and significant technical expertise, Reunion Island could become a player in future industries (such as solar power and information technology) with help from metropolitan France.

### 3.4 Tourism's contribution to GHG emissions

Two types of data are required to evaluate tourism's contribution to GHG emissions in French overseas departments and territories:

- Total GHG emissions. Systematic and consistent analyses of GHG emissions are not carried out in all French overseas territories and departments. In French overseas departments, GHG emissions are calculated as part of France's domestic total under the country's Kyoto obligations. This evaluation is carried out by CITEPA. CITEPA has also calculated GHG emissions for Reunion Island using the same methodology. For Guadeloupe, Martinique and New Caledonia, statistics calculated on an irregular basis were found. No calculations exist for French Polynesia.
- Tourism emissions. These emissions were calculated using information on tourist arrivals. This was possible for all destinations except Martinique.

Tourism's contribution to GHG emissions was therefore calculated for three destinations: New Caledonia, Guadeloupe and Reunion Island (see table in Figure 18).

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<sup>19</sup> This is especially true for before the tourism crisis. 2007 results showed statistics were down on those produced before 2000. 

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For the purposes of this study, tourism's GHG emissions were limited to origin-to-destination transport by aeroplane. This covers most emissions. To account for the specificities of air travel, we doubled CO<sub>2</sub> emissions to give a CO<sub>2</sub>-e (carbon dioxide equivalent) measure.

The calculations combine data from different sources, which were collected using different methodologies. While this approach is not generally recommended, it was unavoidable in a pioneering study of this kind.<sup>20</sup>

Basic statistics for tourism emissions for all destinations were obtained by using an appropriate indicator. Using a single calculation method, the same indicator was applied to arrival statistics, which were assumed to be consistently measured in all destinations. The exception was Reunion Island, where arrival statistics included an "other" category. This category accounted for 15% of tourist arrivals, and did not specify geographical origin. It therefore had to be excluded.

It is also unclear whether regional emissions totals, even when presented in CO<sub>2</sub>-e (in other words, including other gases than CO<sub>2</sub>), were calculated using methods consistent with our aviation emissions calculation method. We were unable to investigate this subject further.

**Figure 18: Tourism's contribution to GHG emissions in French overseas departments and territories in 2007 (in tonnes)**

	CO <sub>2</sub> -e Total	CO <sub>2</sub> -e Tourism	CO <sub>2</sub> -e/resident	CO <sub>2</sub> -e tourism/resident
New Caledonia	2 208 000	260 000	13.45	1.06
Guadeloupe	1 764 000	850 000	3.85	1.88
Reunion Island	4 150 000	839 000	5.12	1.04

Source: TEC

Despite these qualifications, the results are clear. In Reunion Island, tourism produces 20% of emissions per inhabitant. In Guadeloupe, tourism produces 50% (and similar results could be expected for Martinique). In New Caledonia, tourism produces far fewer emissions than the nickel industry. However, despite low tourist arrivals, tourism emissions per inhabitant are similar to those of Reunion Island.

## 4 Same problem, different solutions

While all four destinations studied are geographically isolated, some are more so than others. In the French West Indies, this distance is exacerbated by the region's dependency on visitors from metropolitan France. Closer originating markets are characterised by stronger competition for visitors, making it difficult for the region to

<sup>20</sup> C'est le parti adopté par l'ADEME.

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diversify. In French Polynesia, the honeymoon market is used to compensate for its extreme geographical isolation.

All regions are affected by VFR (visits to friends and relatives) traffic, characterised by low expenditure. The importance of VFR traffic varies from region to region.

Business tourism is less important in the French West Indies and French Polynesia than in New Caledonia and Reunion Island. In New Caledonia, business tourism is fanned by the nickel industry, and in Reunion Island by the region's relatively positive economic outlook.

Each region has a different reputation as far as tourism is concerned. French Polynesia focuses on up-market products, although success is limited. Tourism to the French West Indies is accessible to more middle-class visitors. In New Caledonia, pleasure tourism levels are relatively low.

Other economic activities are important when considering each region's development capabilities.

All four destinations studied faced different emissions situations. Individual emissions reduction strategies must be developed that take into account this diversity. Nevertheless, geographical isolation and dependency on air travel are areas of concern for all destinations.

## II. The way forward

### 1. Tools to improve eco-efficiency

#### 1.1 Reducing air travel

- Developing closer markets

In the short term, developing closer originating markets would help reduce emissions totals. Each destination needs to identify those visitors that produce the least emissions.<sup>21</sup> This can be done using the CO<sub>2</sub>/stay tool, which takes into account distance travelled. In addition, visitors that produce the most emissions, including French visitors, must be discouraged. These measures would contribute to minimising tourism's energy dependency in French overseas departments and territories.

- Reducing flight distances

Encouraging other methods of transport is another possible solution. In some situations, flights are not strictly necessary. Flights between Canada and the south east coast of the United States, for example, could be avoided. Similarly, European visitors could travel by bus or train to a specific departure point. Minimising flight distances, stopovers and connections could reduce CO<sub>2</sub> emissions for some routes. Indeed, a short-haul flight followed by a long-haul flight can produce more emissions than a direct flight.<sup>22</sup>

#### Case study

Two American visitors wish to visit Pointe-à-Pitre. One lives in Los Angeles and the other lives in New York. Let us consider three possible scenarios. In the first scenario, the visitors take the fastest means of transport: flying. Both have to take two connecting flights: first in Atlanta, then in Miami. The visitor from Los Angeles has already produced a third more CO<sub>2</sub> emissions than his New York counterpart.<sup>23</sup> In the second scenario, both visitors travel to Atlanta by train, and fly from there. This allows the visitor from Los Angeles to reduce his CO<sub>2</sub> emissions by around 35%. However, he still produces more emissions than his New York counterpart. In the third scenario, both visitors travel to Miami by train and fly from there. This allows the visitor from New York to reduce his CO<sub>2</sub> emissions by 45%.

For the visitor from New York, emissions drop by 22% between scenarios 1 and 2, and by 40% between scenarios 2 and 3. His emissions are around 20% less than those of his Los Angeles counterpart. Flying to Pointe-à-Pitre from Miami produces the least CO<sub>2</sub> emissions.

<sup>21</sup> cf. destination information sheet.

<sup>22</sup> Takeoff is a major source of GHG emissions. In this example a short-haul flight is combined with a long-haul flight. If the same distance is covered by two medium-haul flights, however, emissions can be lower than a single direct long-haul flight. Takeoff/landing emissions can be less than the emissions produced over a single long-haul flight. Therefore, direct flights are not always the best solution.

<sup>23</sup> There are no direct flights to Point-à-Pitre.

**Figure 19: Three possible scenarios for travelling to Pointe-à-Pitre, Guadeloupe<sup>24</sup>**

	Distance travelled	Option 1: 100 % air travel	CO2-e emissions (tonnes)	Option 2: Flight from Atlanta, with connecting flight in Miami	CO2-e emissions (tonnes)	Decrease between options 1 & 2	Option 3: Flight from Miami	CO2-e emissions (tonnes)	Decrease between options 1 & 3
Departing Los Angeles	6275 km	Los Angeles - Atlanta 3100 km Atlanta - Miami 975 km Miami - Point-à-Pitre 2200 km	0,69+0,28+0,57 = <b>1,63</b>	Los Angeles - Atlanta 3100 km Atlanta - Miami 975 km Miami - Point-à-Pitre 2200 km	0,23 + 0,28 + 0,57 = <b>1,08</b>	<b>-34%</b>	Los Angeles - Atlanta 3100 km Atlanta - Miami 975 km Miami - Point-à-Pitre 2200 km	0,23 + 0,07 + 0,57 = <b>0,87</b>	<b>-47</b>
Departing New York	4375 km	New York - Atlanta 1200 km Atlanta - Miami 975 km Miami - Point-à-Pitre 2200km	0,35+0,28+0,57 = <b>1,20</b>	New York - Atlanta 1200 km Atlanta - Miami 975 km Miami - Point-à-Pitre 2200 km	0,09 + 0,28 + 0,57 = <b>0,94</b>	<b>-22%</b>	New York - Atlanta 1200 km Atlanta - Miami 975 km Miami - Point-à-Pitre 2200km	0,09 + 0,07 + 0,57 = <b>0,73</b>	<b>-40%</b>

Source: TEC, CO2 solidaire, 2009

- Developing the local tourism market

Local tourism markets are often overlooked. However, for destinations with larger populations and higher levels of disposable income, this is a real option for developing the tourism and leisure industries. With a wide range of different landscapes, New Caledonia, Reunion Island and the French West Indies all candidates for this strategy.

With nearly 800,000 inhabitants, Reunion Island is particularly well placed.<sup>25</sup> It offers a wide range of landscapes and activities, combining coastal areas and mountains, cultural heritage and sports activities. While disposable income is relatively low,<sup>26</sup> it is projected to increase as the island develops further. With a strong beach culture and an improving market for short trips, Reunion Island’s local tourism market would benefit from the promotion of different activities and more accommodation options (such as bed and breakfasts or self-catering accommodation). This would generate considerable income and minimise tourism GHG emissions.

Destinations often focus on trying to attract visitors with the most disposable income. They do not differentiate between visitors of different origins, and the fact they might expect different tourism products. As a result, the tourism products on offer are all very similar, which leads to increased price competition. Encouraging local tourism can help lay the foundations for a solid local economy, based on local enterprise and sustainable economic development. A successful example is the Var region, in France, where most Provence residents spend time in summer, whether for a weekend or longer. This local visitor base means the region has withstood the effects of the economic crisis. Encouraging local tourism also reduces the effect of seasonal peaks.

Generally speaking, some French overseas departments and territories would be better placed to develop local tourism than others. New Caledonia is one example, with fast improving living standards, adequate infrastructure and a large geographical territory. For the French West Indies or French Polynesia, developing the local market will depend on available resources and the tourism products on offer (including accommodation and activities).

<sup>24</sup> To calculate rail transport emissions, we used a coefficient for diesel trains, 74.8 g CO2-e per km travelled.

<sup>25</sup> INSEE projects the population will grow to over 1 million by 2030.

<sup>26</sup> According to INSEE estimates, this is 10,800 Euros gross per year (average estimate for French overseas departments).

### 1.2 Improving passenger load factors

By improving a flight's passenger load factor (PLF), GHG emissions coefficients per kilometre decrease. This is therefore a useful tool. There are two ways to ensure flights are full: decreasing supply or increasing demand. As our aim is to reduce air transport CO<sub>2</sub> emissions, we developed hypotheses based on reducing or maintaining current flight levels, and improving current passenger load factors. There are several ways to improve passenger load factors. Firstly, passenger load factors on flights to French overseas territories are generally weak. This is due to the territorial continuity policy, which imposes regular flights even though there is insufficient demand for seats. Several operators have closed down. Those currently operating receive subsidies, in one form or another. While the territorial continuity policy is still in place, no decrease in flights is possible. However, there is a logical solution to this exceptional situation in a market economy. It consists of filling flights "at any cost". A plane produces the same emissions whether it is full or not. To maximise efficiency, airlines should open their bookings to more passengers. Early bird tickets at attractive prices are one possibility. A second possibility is selling or even giving off-peak tickets to certain groups at discounted prices if they respect conditions like:

- Travelling during the off-season (for public servants and their families that come from French overseas territories);
- Staying at least two months at the destination (for retired people and students);
- Staying at least 6 months at the destination (for other groups).

### 1.3 Increasing the length of stay

Increasing the length of stay (LOS) can improve tourism eco-efficiency. Longer stays mean a better CO<sub>2</sub>/overnight stay ratio. Longer stays could be encouraged by offering products like local or regional tours. However, any new products developed must be CO<sub>2</sub> neutral, and travel, especially by plane, must be limited. In addition, destinations should fix precise targets. An initial objective, for example, could be an average LOS of three weeks. There are different ways of attaining this objective. Some examples are price discounts on early ticket purchases by visitors reserving stays of over one month, or one week in a hotel = one week free. This could give rise to products such as:

- cruises with longer stops at each port of call (especially in New Caledonia and the French West Indies where cruise ships only stop for one day);
- package deals including one week at the seaside + one week cruising / trekking + one week in a less visited region;
- package deals including 10 days trekking/rural self-catering accommodation + 5 days at the seaside + one week free in a less visited region;
- interisland circuits in the Guadeloupe, French Polynesia, and Martinique archipelagos, using non-polluting means of transport and limiting travel distances;
- tours of destinations with large enough surface areas: French Guyana, New Caledonia and Reunion Island;

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- tours between two associated destinations allowing CO<sub>2</sub> emissions to be shared between the two regions: for example, Martinique + Guadeloupe, Reunion Island + Mauritius, or New Zealand + Vanuatu;
- long-term rental accommodation in self-catering cottages or apartment hotels, for mid-range or over-fifties visitors. This depends on developing specific accommodation facilities.

With longer LOS, it is important to encourage methods of transport that pollute less. Additional trips by plane, cruise boats or 4WD must be avoided in larger territories. “Green” tourism strategies should be adopted. Examples include self-catering accommodation, non air conditioned facilities, and travelling on foot where possible.

Longer LOS also encourage longer and more geographically varied trips. One possibility is increasing tourism to zones that are currently overlooked by visitors. Another possibility is attracting tourists during the off-peak season. This strategy would encourage environmentally friendly tourism with benefits for more groups of the local population. Tourism could become a development tool for the entire destination. Encouraging year-long tourism arrivals would also increase earnings, and create a more efficient and profitable industry.

### 1.4 Increasing tourist expenditure

Eco-efficiency scores can also be improved by increasing tourist expenditure. To do so, destinations must consider their market position and strategy.

Understandably, many destinations attempt to develop profitable tourism activities. However, sustainable development does not only mean creating luxury products for the richest target markets. It is also about developing environmentally friendly and ethical tourism products for all target markets.

Initiatives to increase expenditure must therefore be undertaken carefully. They must involve the local economy. Examples include developing self-catering accommodation or local accommodation facilities, using local suppliers for interior design, services and catering. These actions all benefit local populations. Increasing expenditure can also mean focusing on certain kinds of tourists. In New Caledonia, for example, tourists on cruise liners spend an average of € 32 a day, compared to € 71 a day for a traditional tourist. Meanwhile, French tourists spend an average of € 46 a day.

### 1.5 Using eco-efficiency to build strategies

- Building niche strategies

It is unlikely that niche strategies alone can ensure a 40% reduction in GHG emissions by 2025 compared to 2005 levels. Generally speaking, niche markets attract insufficient visitors to have a significant influence on total emissions. Therefore, to affect GHG emissions, strategies must focus on markets with larger numbers of visitors.

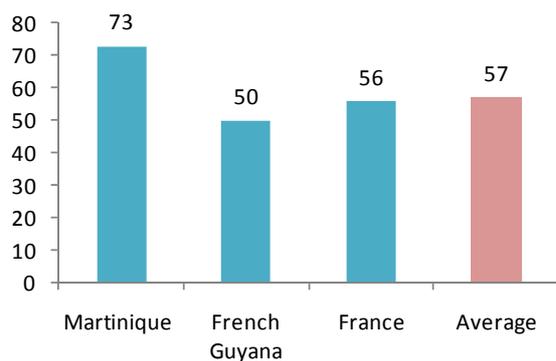
Eco-efficiency is a useful tool to evaluate potential tourism strategies. While geographical proximity is generally a useful indicator for GHG emissions, visitors who spend the most are

## CARBON DEPENDENCY AND TOURISM DEVELOPMENT

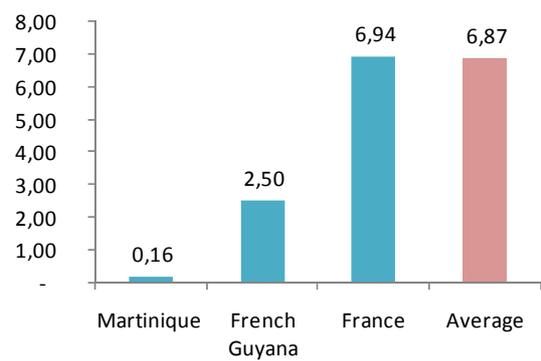
not always the most desirable clients. Often French visitors are more eco-efficient than Japanese visitors, despite low expenditure and higher distance travelled. This is because Asian visitors regularly choose very short stays. Their overall expenditure levels can be lower than those for a French visitor. In addition, Asian visitors prefer tours, which generate more trips at the destination. This is an additional source of GHG emissions.

**Figure 20: Comparison of daily visitor expenditure and eco-efficiency/Euro in 2007<sup>27</sup>**

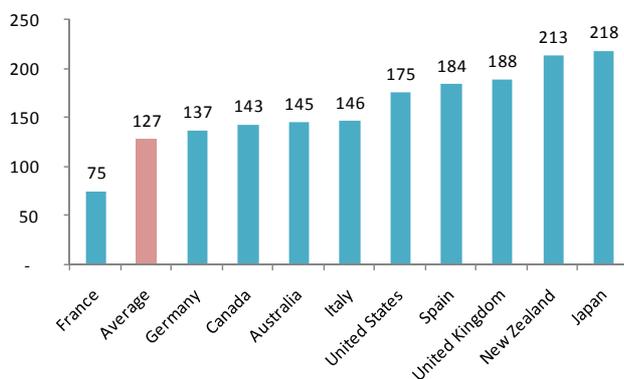
**Daily visitor expenditure in Guadeloupe in 2007 (€)**



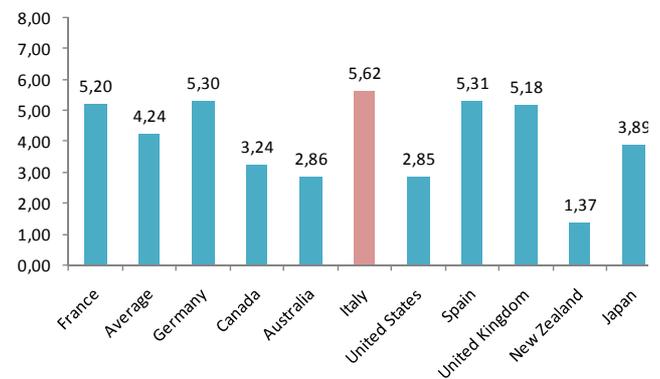
**Eco-efficiency scores for Guadeloupe in 2007**



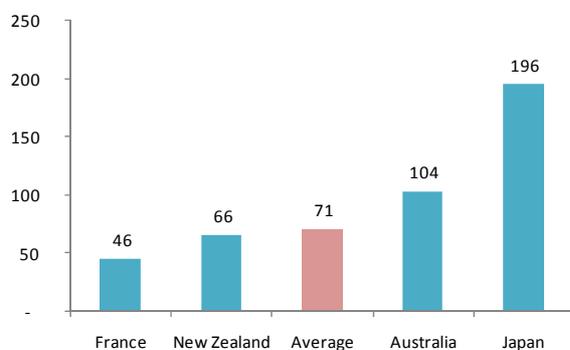
**Daily visitor expenditure in French Polynesia in 2007 (€)**



**Eco-efficiency scores for French Polynesia in 2007**



**Daily visitor expenditure in New Caledonia in 2007 (€)**



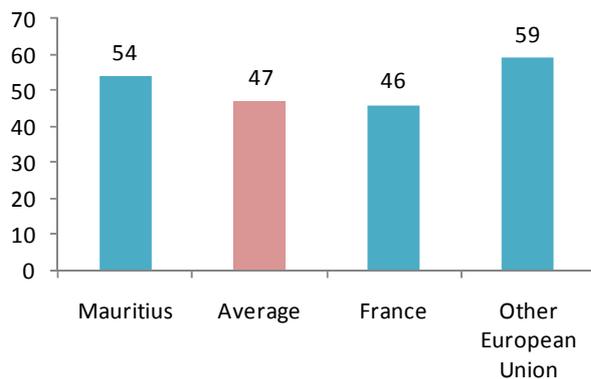
**Eco-efficiency scores for New Caledonia in 2007**



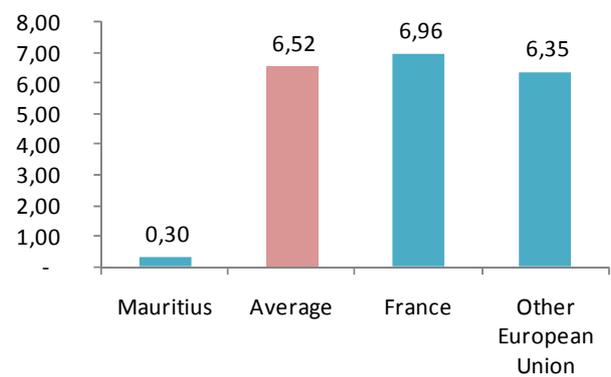
<sup>27</sup> 2007 was chosen as data for this year was available in studies, and not obtained by hypothesis as in 2025.

## CARBON DEPENDENCY AND TOURISM DEVELOPMENT

Daily visitor expenditure in Reunion Island in 2007 (€)



Eco-efficiency scores for Reunion Island in 2007



Source: TEC, 2009

### - Difficult choices

Reducing GHG emissions by 40% involves important changes. Visitors from metropolitan France, currently present in large numbers, will decrease significantly given their geographical distance. Metropolitan visitors travelling for pleasure may find other destinations in Spain and Africa (North Africa and Senegal rather than the French West Indies and Reunion Island) more attractive. For those travelling to visit friends and relatives, the situation is more difficult. This affects Reunion Island and French Polynesia in particular.

Destinations will need to compensate the drop in arrivals from France with increases from other markets. For Caribbean destinations, this could involve replacing metropolitan visitors with visitors from the east coast of the USA. New target markets may be smaller than traditional markets. Importance must therefore be given to developing appropriate products and customer rewards programmes adapted to new visitors. Destinations must focus on building different brand images to those of competing destinations, based on local heritage or innovation. This may contribute to an increased market share.

### - Optimisation strategies

To improve eco-efficiency scores, destinations must consider strategies that optimise both transport emissions and tourist facilities. There are two possible approaches to optimisation strategies. In the first approach, destinations adapt tourism products to the client. An example of this approach is promoting luxury tourism products to attract visitors that spend more. Another example is creating package deals that encourage longer lengths of stay. In the second approach, visitors adapt to the product on offer for convenience reasons. One example of this approach is offering lower prices to certain groups (like senior citizens and students) for long stays or trips during the off-peak season via associations. Another is passing unsold tickets on to state or local authorities so they can be given to underprivileged groups to reduce air transport emissions coefficients.

Flights produce GHG emissions whether they are empty or full. It makes sense to encourage a maximum number of travellers, while facilitating travel by underprivileged groups. This would increase occupation rates in self-catering accommodation, bed and breakfasts and condominiums, thus supporting the development of associated tourism activities.

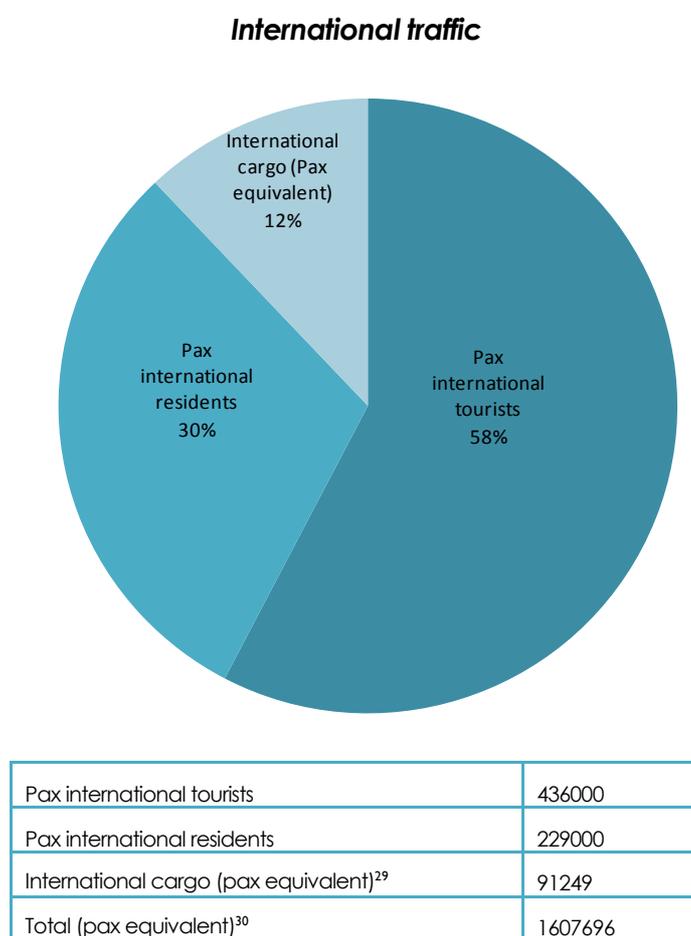
## 2. The carbon budget

### 2.1 Increasing tourism’s air traffic share

Our aim is to identify strategies to reduce tourism GHG emissions by 40%. However, tourism is not the only source of air traffic. Resident traffic and cargo also contribute to aviation statistics. We can therefore reduce aviation emissions by 40% by increasing or decreasing tourism, resident or cargo contributions to air travel. This gives rise to several options.

First, cargo could be reduced in favour of tourism. This strategy would help counter the drop in tourism arrivals. Currently, however, cargo only represents 10% of the total volume transported.<sup>28</sup> In French Polynesia, decreasing cargo by 10% would allow 12% more passengers. In addition, this would create problems in transporting supplies to French overseas territories and their residents.

**Figure 21: Air traffic statistics (in passenger equivalents) to French Polynesia**



Source: TEC, CCI, 2009

<sup>28</sup> Statistics are for imports in passenger equivalents. Export statistics (leaving the territory in tourism terms) are much lower.

<sup>29</sup> Cargo/pax conversion: 1 passenger = 160 kg cargo (source: UNWTO-UNEP-WMO 2008, "Tourism and Climate Change. Responding to Global Challenges").

<sup>30</sup> Travel to and travel from are calculated separately.

For residents, this would involve a radical lifestyle change. Imports from metropolitan France would become a thing of the past. While this choice might lead to more independence in the long term, it cannot be simply imposed on local authorities. Doing so could lead to considerable social unrest. A tourism strategy based on reducing cargo statistics would need to be accompanied by alternative supply strategies.

Another possibility would be to reduce resident traffic to increase tourism traffic. Once again, this would have social consequences, affecting the territorial continuity policy. However, the margins for manoeuvre are much wider: 30% for French Polynesia and 40% for the French West Indies.

As seen here, different options are open to local authorities, in consultation with local populations. They involve a joint definition of future lifestyles as well as desired tourism target markets and their profitability.

### 2.2 Increasing tourism's contribution to the overall carbon budget

If, instead of looking at air traffic alone, we consider the destination's total carbon budget, other solutions become possible. The aim is to reduce overall emissions by 40%. Instead of requiring each sector to reduce emissions by 40%, it may be possible to establish different emission reduction rates for different sectors. In other words, some sectors would reduce emissions by 60% and others by 20%, to produce an average emission reduction rate of 40%. For example, should tourism and agriculture both be encouraged, should tourism only be encouraged or should agriculture only be encouraged? Eco-efficiency is a useful tool for these strategic choices.

- Practical and technical limitations

There are limits to this approach. First and foremost, destinations must have reliable emissions data at their disposal. However, few French overseas departments or territories have carried out emissions inventories. Measuring industry-specific emissions contributions to emissions totals would therefore be difficult. Secondly, many territories lack viable alternatives to tourism.

This kind of strategy is more appropriate for countries like France, which carries out regular emissions inventories. It underlines the importance for French overseas departments and territories to anticipate emissions reductions targets for 2025 and 2050. Any development of the tourism sector must take into account other less emissions-intensive industries.

- Different situations

Each destination is different. In New Caledonia, for example, the nickel industry is extremely important. Seen from an international division of labour perspective, New Caledonia is one of the most efficient nickel producers worldwide. We have therefore developed two possible scenarios for this destination. Each accords a different weighting to tourism and nickel production. As each industry has similar eco-efficiency scores, decision-making must be based on social rather than economic criteria.

In the first scenario, most of the carbon budget is set aside for the nickel industry. Tourism emissions drop by over 50%. The remaining tourism emissions benefit the nickel industry:

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business tourism accounts for 39% of tourism emissions, regional and luxury tourism for 44% and, finally, VFR tourism for 13%. In the second scenario, the carbon budget is divided equally. Tourism emissions only drop by 40%, and pleasure tourism and VFR traffic increase slightly.

In Reunion Island, the information technology (IT) industry has significant potential. As such, it could become an alternative to tourism in the island's economic development. This is especially true given that the IT industry does not require extensive infrastructure. However, we were unable to build a scenario, due to a lack of available information.

Tourism is the primary source of income in French Polynesia, and it is difficult to identify viable economic alternatives. The destination is the most geographically distant and is spread over a wide area. To maintain the tourism industry despite the emissions generated, the most likely solution appears to be purchasing carbon credits on the international market. In the long term, tourism products would need to undergo significant changes. In particular, longer LOS could be encouraged, but would be dependent on a change in mentality.

In the French West Indies, other factors may facilitate adaptation to carbon constraints. In French Guyana, for instance, carbon capture by the Amazon forest may compensate for some emissions. These factors should be taken into account, even if current information is insufficient to evaluate their viability.

### 3. Learning from scenarios

The discussion above presented the different tools available to French overseas departments and territories to reduce tourism transport emissions. These tools have been used to develop and refine sustainable development scenarios, presented below.<sup>31</sup>

#### 3.1 Falling tourist arrivals: going against international previsions

For all the destinations studied, a drop in emissions means a drop in arrivals. The extent of this decrease depends on the viability of substitute markets. As islands, all destinations rely on air transport. Alternative transport modes are therefore not an option. Even so, emissions reductions may be made possible by transferring visitors to key departure points by train or bus. However, it is difficult to quantify the effect of such strategies. Consequently, they have been excluded.

As seen in

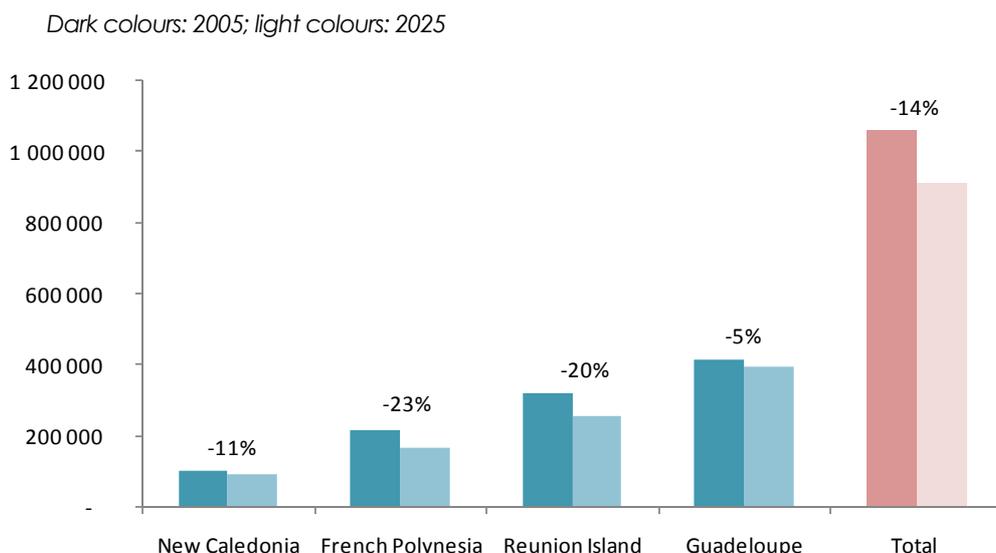
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<sup>31</sup> Based on a similar 40% emissions reduction and increased tourist expenditure hypothesis.

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Figure 22, Reunion Island is the most affected by a fall in tourism arrivals. For this destination, arrivals decrease by 20%. The French West Indies are least affected, with a 5% decrease in arrivals. Across all destinations, arrivals fall an average of 14%. This trend goes against previsions published by the World Tourism Organisation, which predict annual growth in the tourism sector of around 4% until 2020.

**Figure 22: Arrivals in 2025 according to the sustainable development scenario**



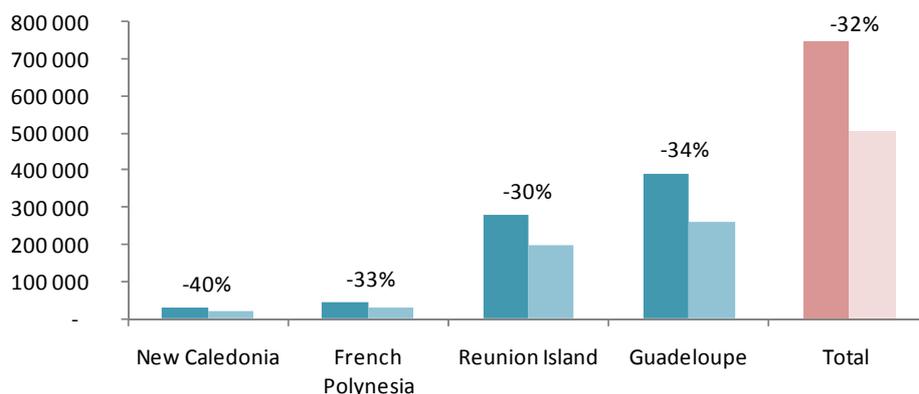
Source: TEC

These predictions have important implications for French overseas departments and territories. For the destinations studied, it means that the development objectives drafted in 2000 are unlikely to be attained. It also means that rethinking the future of tourism must start now. Investing in additional accommodation facilities, for example, may be incompatible with future growth projections. Instead, renovating or reorienting existing structures for new markets seems a more pertinent choice.

### 3.2 Moving away from the French metropolitan market

For all the destinations studied, visitors from Metropolitan France will probably become less frequent. While metropolitan France is currently one of the largest markets for French overseas departments and territories, it is also one of the most geographically distant. In the scenarios, the decrease in metropolitan arrivals was sometimes spectacular, as seen in Figure 23. Total metropolitan arrivals for all destinations dropped by a third. New Caledonia was most affected, for two reasons. First, it has viable substitute markets and, second, it may become more politically independent of France. Reunion Island is least affected, because of the large proportion of VFR traffic.

**Figure 23: Metropolitan arrivals in French overseas departments and territories, 2007-2025**



Source: TEC

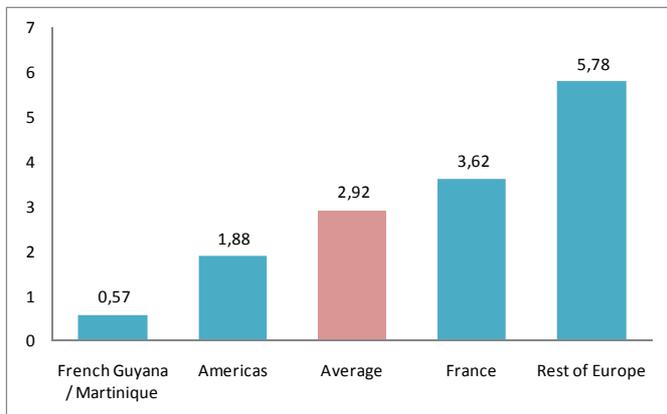
This observation also raises issues. First, French tourists travelling for pleasure will probably be able to choose closer alternative destinations if overseas territories and departments become less accessible. However, this is not true for French tourists travelling to these destinations for business reasons or to visit friends and relatives. Secondly, if metropolitan tourist arrivals fall in favour of other closer markets, this may have an impact on destination populations. Inevitably, this will affect destinations' ties to France, with whom they have a shared culture and heritage.

### 3.3 Identifying desirable markets: combining parameters

As explained above, eco-efficiency can be calculated using several parameters. Generally speaking, the closest markets produce the least emissions. In addition, high daily tourist expenditure does not always make arrivals from more geographically distant markets more desirable. Indeed, high daily expenditure must be combined with a minimum length of stay, in order to compensate for emissions generated during transport to and from the destination. Consequently, metropolitan French visitors with long LOS can be more eco-efficient than Asian visitors, as seen in Figure 24 below.

Figure 24: Comparison of the most eco-efficient markets by factor

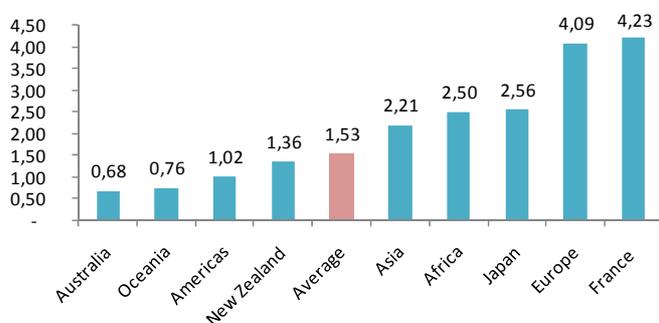
**Eco-efficiency/Euro spent Guadeloupe 2025**



**Factors**

Rest of Europe	50 €	12 jours
French Guyana / Martinique	60 €	15 jours
Americas	73 €	16,9 jours
France	45 €	20 jours
Average	46 €	18 jours

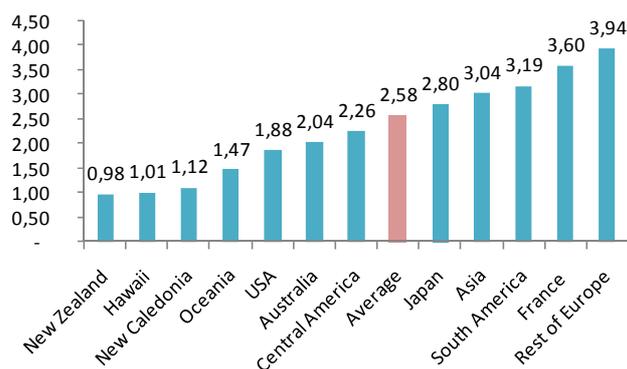
**Eco-efficiency/Euro spent New Caledonia 2025**



**Factors**

Australia	111 €	13,6 jours
Oceania	77 €	17,3 jours
Americas	126 €	47 jours
New Zealand	71 €	9,6 jours
Average	66 €	22,6 jours
Asia	146 €	11,5 jours
Africa	61 €	41,8 jours
Japan	208 €	6,6 jours
Europe	47 €	43,6 jours
France	44 €	45,6 jours

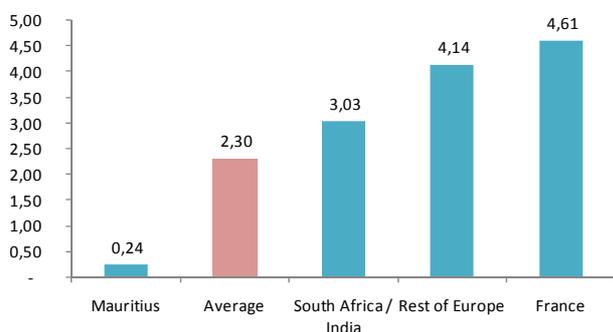
**Eco-efficiency/Euro spent French Polynesia 2025**



**Factors**

New Zealand	189 €	11,5 jours
Hawaii	152 €	14,5 jours
New Caledonia	108 €	19,4 jours
Oceania	139 €	13,3 jours
USA	163 €	13,5 jours
Australia	128 €	12 jours
Central America	125 €	12,9 jours
Average	128 €	15,9 jours
Japan	188 €	9,4 jours
Asia	171 €	9,8 jours
South America	120 €	12,8 jours
France	79 €	27,7 jours
Rest of Europe	132 €	16 jours

**Eco-efficiency/Euro spent Reunion Island 2025**



**Factors**

Mauritius	56 €	8,6 jours
Average	43 €	20,6 jours
South Africa / India	56 €	11,8 jours
Rest of Europe	64 €	16,2 jours
France	44 €	23,4 jours

Source: TEC 2009

While eco-efficiency may appear a relatively simple tool, it can produce complicated and conflicting information. In theory, it is easy to identify the perfect market: visitors are close, have high daily expenditure and long LOS. The market is also large enough to guarantee a high number of tourist arrivals.<sup>32</sup> In practice, however, perfect markets are hard to find, especially for French overseas departments and territories. Compromises must be made. In this study, we tested several options before finding the most relevant solution. Other solutions may also be feasible, depending on the destinations' priorities. However, the emissions reduction objective significantly reduces the options available. In addition, the parameters are not independent. Their interactivity must be taken into account when building scenarios.

### 3.4 Creating a competitive advantage

In line with these observations, French overseas departments and territories must focus on increasing overall tourist expenditure. This will partially compensate for lower tourist arrivals and increase tourism profitability. In the short term, this means focusing on more profitable target markets. However, this will be insufficient for the most geographically distant destinations. Increasing average expenditure over all markets by is therefore essential. This can be done by developing more luxury products adapted to target markets. This strategy is valid for all destinations, including French Polynesia, which already offers tourism products for luxury visitors.

When rethinking tourism strategies, destinations must develop products to set themselves apart from competing destinations. New tourism products must be innovative and reflect destinations' unique cultural heritage. Product quality is another essential factor.

Competing destinations will be looking to adopt similar strategies. Consequently, destinations in this study should adopt adaptation measures immediately. Importance should be given to developing products that give a real competitive advantage.

<sup>32</sup> France's most eco-efficient market is Switzerland. Swiss visitors are geographically close, spend more and have reasonable LOS. However, total Swiss arrivals are currently low.

### 3.5 Encouraging longer LOS

Encouraging visitors with longer LOS should be another, complementary goal. As seen in

Figure 24, expenditure is not the only important factor for tourism strategy. Longer LOS can be more important for tourism revenues than expenditure: it is easier to double the LOS than overall expenditure: tourists also have a budget. To encourage longer LOS, mid-range accommodation facilities (including self-catering accommodation, bed and breakfasts and condominiums) should be developed. Tax exemptions for French overseas departments and territories<sup>33</sup> may be one possible solution. This strategy would create the following advantages:

- Wider target markets, including students, senior citizens and domestic tourists.
- Less seasonality, with advantages and promotions for tourists visiting during the off-season.
- A wider geographic distribution of tourism revenues, with tourists visiting more regions. Tourism products could be developed to encourage this trend. An example would be inland tours, including hiking and excursions (like in Corsica), alternating with beach tourism.
- A wider socioeconomic distribution of tourism revenues, with local residents being involved at all levels of tourism activity. Longer LOS encourage more residents to invest in self-catering accommodation facilities, decreasing the market share of large tour operators' market-share and eliminating middlemen between tourists and tourism providers.
- Better resistance to crises. If one segment fails, others are there to take its place.

### 3.6 Developing the local market

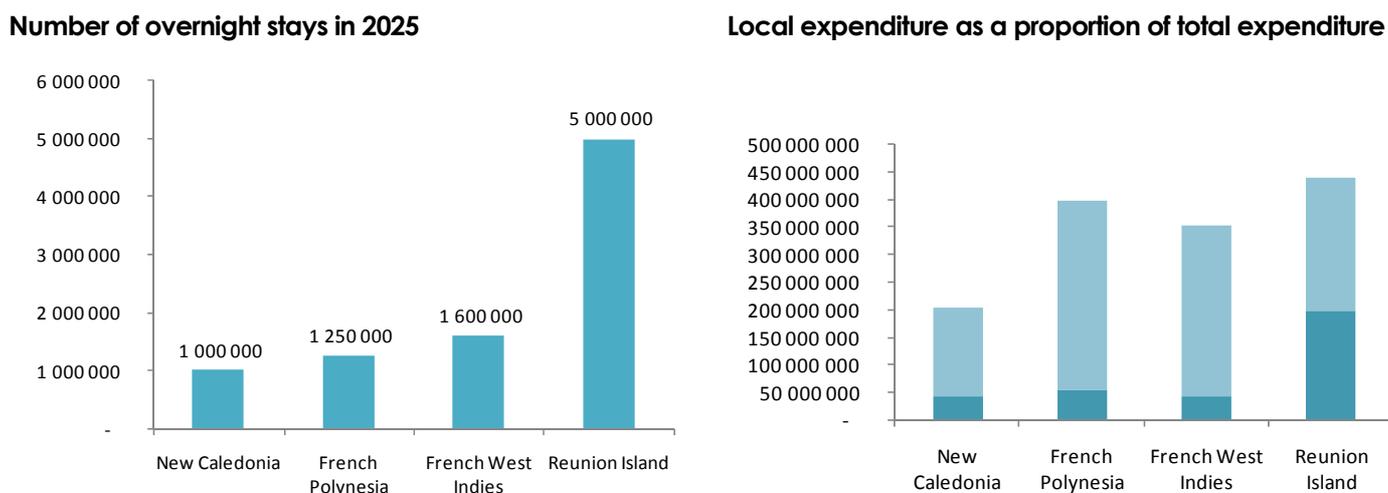
Developing local markets was initially only considered for Reunion Island and New Caledonia, as these two destinations had higher standards of living. However, the difficulty in attaining GHG emission reduction targets meant this strategy had to be extended to all destinations. Consequently, the importance of the local market varies, as seen in

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<sup>33</sup> Pursuant to the Loi Scellier, which replaces the Loi Girardin.

Figure 25.

Figure 25: Expenditure by local markets in 2025



Source: TEC

We chose to consider that local markets did not generate additional GHG emissions. An exception was made, however, for French Polynesia, where a 1,200 km surplus was added per visitor. This represents an average distance travelled for domestic trips.

### 3.7 Accessing closer originating markets

The most obvious tourism strategy is to encourage closer originating markets. However, this is easier said than done. As explained above, the closest markets do not always meet all criteria. In particular:

- They may not be large enough. Examples include Fiji for French Polynesia and Vanuatu for New Caledonia.
- They may not have longer LOS. The LOS for Asian visitors to New Caledonia, for example, is well below average. This is also true for the LOS of American visitors to the French West Indies.

Decision-making by stakeholders needs to take these parameters into account. We initially considered emerging markets were a solution. However, we had to revise this position given the difficulty in building hypotheses based on transport and changes in demand. For example, will air links between South America and Polynesia be developed? How will tourism demand evolve in the Middle East and in India?

### 3.8 Working together

Building scenarios is a complicated exercise. Given the likely impacts on lifestyles for both originating and destination markets, joint decision-making structures are essential. This is the only method likely to ensure community-wide adherence to tourism policies. Here, the “community” includes all those involved in tourism activities: tour operators, airlines, managers of leisure or accommodation facilities, and political decision-makers on the local, regional and national levels.

It is also important that destinations validate the parameters chosen to develop these scenarios. Their involvement is essential in successfully implementing tourism development strategies. They are also well placed to identify how to divide up the carbon budget.

Finally, from a democratic point of view, it is important to explain the issues, the strategies developed, as well as probable lifestyle changes (including in terms of leisure and tourism), to all stakeholders involved.

### 3.9 Setting a starting point

The limits of this study have been clearly defined, so as to provide an initial overview of the situation in selected French overseas departments and territories. By combining different parameters, we have identified possible strategies for each destination. It is hoped that each territory will use the information in this study and adapt it:

- Using available complementary data: concerning tourism or carbon inventories, for example;
- Taking into account international agreements and objectives introduced in the future; and,
- Using local development priorities and carbon budget preferences.

### 3.10 Questions raised

Developing projections for 2025 is a difficult exercise. It is very different to building projections based on trends or rethinking the future of tourism. Nevertheless, our hypotheses are possible and the final results are not catastrophic.

The most important step is overcoming resistance to the idea of climate change. The wider public must accept that their future is not likely to resemble what they may have imagined.

These scenarios combine increased economic development with decreased environmental damage. However, they necessarily involve important societal shifts. Populations are currently unprepared for such radical changes. Examples include:

- A decrease in tourism mobility. This is in direct contrast to the current trend, established over the last ten years, which involves frequent short stays. While this may have limited impact for pleasure tourists, the same cannot be said for VFR traffic. In the scenarios developed, VFR traffic has been maintained, although it generates lower revenues. This seems to be an important priority for the populations of French overseas departments and territories. Theoretically, other choices are possible.
- A decrease in tourist arrivals. Once again, this goes against international provisions and professional expectations. While the scenarios indicate an increase in revenues, the changing carbon constraint will undoubtedly affect the structure of the tourism sector. Increased competition, shifts in demand, increased seasonality, and fewer facilities (closed because of fewer arrivals) are likely to be some consequences.

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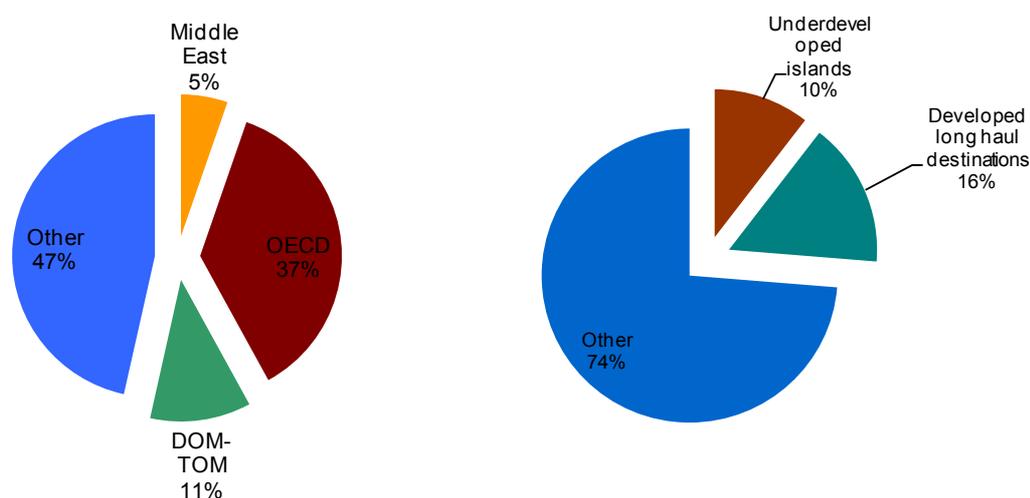
To limit the effects of climate change and prevent irreversible damage to the environment (including the death of coral reefs and scarce drinking water), the carbon constraint must trigger a change in mentalities.

Adapting to climate change now is a strategic choice. It could be the deciding factor in maintaining a competitive economy. Regulations are inevitable, unless governments accept the prospect of catastrophic climate damage.

In the last part of this report, we will move beyond the tourism industry to place our conclusions in the context of international GHG emissions negotiations.

### III. Post Kyoto: what comes next for tourism in French overseas departments and territories?

Figure 26: French tourism emissions in 2007 by destination type



Source: Dubois and Ceron 2009

We were able to establish a reliable GHG emissions table for all the French overseas departments and territories studied. Calculations focussed on the main source of GHGs: origin to destination transport emissions. While on-site transport and accommodation and leisure facilities also produce GHG emissions, these are best dealt with by local energy-efficiency institutions and instruments (by promoting new energy sources or discouraging air-conditioning, for example). The most significant source of GHG emissions is tourist transport, in particular air transport. This statement, valid for the French West Indies, Reunion Island, New Caledonia and French Polynesia, is also relevant for other destinations, including French Guyana, Mayotte, Saint Pierre and Miquelon. Dependency on air transport is a common trend, although this may be for different reasons in different destinations. French metropolitan tourists can find tropical destinations closer than the French West Indies. Distance is also a factor for Reunion Island. French Polynesia is, relatively speaking, far away from everything. To a lesser extent, so is New Caledonia.

Tourism to French overseas destinations and territories is already fragile, as evidenced by the decreasing number of arrivals over the last few years. The French West Indies and French Polynesia, and to some extent Reunion Island, are particularly affected by this trend, given their dependency on the tourism industry. This decrease in tourism seems unique to these destinations: neighbouring regions have experienced increases in tourist arrivals.

Climate change will aggravate this already complicated situation. Limiting GHG emissions will not only be difficult for French overseas departments and territories but also for metropolitan France. In recent studies, we noted that climate change was likely to have

an alarming impact on tourism to France. This was true regardless of whether tourists were French (from overseas departments or territories or France itself), or international (despite France's proximity to European originating markets and therefore not requiring air transport). Eco-efficiency scores and sustainable development scenarios to 2050 (Ceron and Dubois 2006) both produced the same results. The problem is therefore not unique to French overseas departments and territories. However, as our results show, these destinations are likely to be more affected than others.

In the first part of this report, we saw that significant emissions reductions were necessary to avoid irreversible climate damage. Globally, emissions must decrease by 80% by 2050, with emissions peaking in 2015. If underdeveloped countries are to be left some margin for manoeuvre, this means that developed countries must essentially become carbon neutral by this date. Some countries, including Norway and New Zealand, have already adopted this objective. Others have begun the process. The Alps are one example.

Emissions produced by French overseas departments are included in emissions totals for metropolitan France (an industrialised "Annex 1" country). Consequently, a joint emissions reduction target will probably be set for France and its overseas departments. Any flexibility awarded to overseas departments will therefore require extra efforts by France. As France is unlikely to attain its own objectives without significant difficulty, it would be wise for overseas departments to not expect preferential treatment.

The situation for French overseas territories is different. Overseas territories are entitled to request their emissions be calculated separately to those of France. They can also request small island status. The IPCC, concerned by the fate of these regions, is likely to allow them some concessions in negotiations (although to what extent is uncertain). However, this status will not be granted easily, especially given French overseas territories' economic and institutional ties to France (transfers to the Seychelles are less than 30% of GDP, unlike to French Polynesia). Even if these regions received support from the international community, emission reduction efforts would still need to be considerable.

While some long term objectives and changes appear inevitable for French overseas departments and territories (unless we resign ourselves to irreversible climate damage), the situation in the short and middle term is much less clear. This is worrying for the long-term situation. The current negotiation environment, however, appears relatively open.

At the time of writing in mid 2009, global leaders are still negotiating a post-Kyoto agreement. This will determine country-specific emission reduction targets, to be confirmed at Copenhagen in December. It is impossible to predict the results of this negotiation process. At this stage, developed countries have proposed targets that are inconsistent with the 80 % global target mentioned above. Developing countries have denounced these efforts as unacceptable, an understandable point of view. At the same time, however, developing countries have also failed to put forward objectives that contribute to attaining this goal. It is also questionable whether targets put forward by some countries will be respected. One example (among others) is China: will central government be able to enforce emission reduction targets in provincial governments?

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It is also highly likely that concessions for particular countries and activities will be the subject of heated discussion. Some measures already exist under the Kyoto Protocol (such as negotiable permits and Clean Development Mechanisms). In theory, they may be justified, however, in practise, they are incompatible with long-term reduction objectives. After the crisis, carbon prices crashed on financial markets. Clean Development Mechanisms (CDMs) generally only concern extremely large projects in a few countries, meaning community-level sustainable development initiatives lack financing. These measures must be critically reviewed and modified. For example, emissions quotas should be reduced for some economic activities. Initiatives should be implemented on a global level. Some countries and economic sectors risk relying too heavily on concessions and compensation for their efforts, given that these measures must only be awarded in exceptional cases. The aviation industry, as presented above, is a good example of this attitude. This industry is concerned with preserving its own development potential by purchasing negotiable permits, compensating emissions and implementing CDMs. This sector-specific approach may not be consistent with international goals.

In this context, it is difficult to define strategic objectives. Even for those who are aware of emission risks and their importance, adopting a position that puts them in a weak position with respect to their competitors would be unjustified unless it resulted in a competitive advantage in terms of niche markets or image. This may not always be possible.

There are several possibilities:

1) The results of the Copenhagen summit prove to be disappointing. A "business as usual" scenario is adopted, with some isolated reduction initiatives. For example, a carbon tax may be introduced that only applies to certain sectors, like aviation. Its effects would be insufficient to have a significant impact on air traffic flows. Economic growth would therefore be based on past market conditions, that fail to take environmental factors into account. This possibility is all the more real given the content of post-crisis stimulus packages. In this situation, measures are inadequate to deal with the risks. Too late, reality hits. Some of the likely consequences are:

- A considerable increase in petrol prices, up to and above levels previously experienced. In a few years, peak oil production will most likely be attained. Prospection efforts will probably drop off, given the effects of the crisis and the focus on unrestricted economic development. Demand from emerging economies will push up prices. In the short term, the aviation industry will fare better than others (such as heavy industry), given low price elasticity. Nevertheless, increases in trip costs will be considerable, meaning tourism will become less accessible. As income distribution becomes increasingly unequal, tourism will only be an option for the most well off. The destinations examined in this study face different risks. However, even the best placed will have to take into account the increasingly competitive nature of the (necessarily small) luxury tourism market.
- More serious long-term effects of climate change. This will be particularly disastrous for tropical islands (due to an increased likelihood of cyclones, rising sea levels and irreversible damage to coral reefs) and populations in underdeveloped countries

(IPCC 2007). Middle term luxury tourism strategies will have to take these risks into account, adapting products and infrastructures accordingly.

2) The second possibility is that the Copenhagen negotiations lead to targets coherent with our scenarios (based on the EU's 2020 strategy, with objectives to the year 2025). This study then takes on a whole new dimension. In the short term, reduction targets may remain moderate. In a few years, however, petrol prices will begin rising. While this increase will be less marked and more controlled than in the "business as usual" situation outlined above, it is still an important factor in reducing carbon dependency. It is important to take this factor into account in planning for the future. For destinations, this should come into play when identifying new markets and creating new tourism products. The scenarios developed in this study should serve as tools for strategy building and economic impact analyses. The carbon constraint does not necessarily mean the end of the tourism industry. However, reorientation strategies should be carefully thought out: while competition for tourist arrivals is likely to be fierce, first movers will no doubt obtain a competitive advantage.

In this situation, French overseas departments and territories must request concessions from the French government and international authorities. The arguments in their favour are considerable and include their geographical isolation, distance, and limited economic development capacities. These arguments and their limits have been presented above.

The scenarios developed here are valid until 2025. It is likely that further and perhaps increased emissions reductions will be required after this date,<sup>34</sup> given the long-term objective of a low carbon economy. In this situation, concessions will only be temporary in nature.

3) The third possibility is that the objectives fixed at Copenhagen target an 80% emissions reduction by 2050. For developed countries, this means shifting to a carbon neutral economy. The EU targets adopted in our scenarios are inferior to this objective. Emissions reductions in French overseas departments, as well as French overseas territories, would need to be reinforced. Air transport would probably be singled out as major contributor to GHG emissions. Consequently, air travel would be reserved for the most urgent purposes (such as health or higher education). In this situation, tourism revenues would drop significantly.

### **From theory to practice: turning research into strategies**

This study is an initial step in rethinking tourism in French overseas departments and territories. Despite limited resources, the results obtained are striking enough to contribute to raising awareness of this problem amongst stakeholders. The theories presented here are open to discussion, and were produced under time and budget constraints. In particular, there may be issues as to:

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<sup>34</sup> Parry, M., J. Palutikof, et al. (2008). Climate policy: squaring up to reality. *Nature Reviews: Climate Change*.

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- Methodology: the data obtained for Reunion Island only concerned 85% of tourists. 15% of tourists were classed as "other", and therefore not included in our analysis. This decreases 2007 emissions totals.
- Economics: the price of airfares could increase significantly between now and 2025. This would limit long haul travel.
- Policy: changes may be made to the territorial continuity and airfare reimbursement policies.
- Society: as populations become more aware of climate change issues, their choice of holiday destination may evolve.

The next step is to widen the debate to stakeholders: actors on the ground should be given a chance to react to these results. This discussion could include two dimensions:

- A discussion of the objectives and hypotheses used during scenario construction.
- Widening data sources where data were lacking.

Indeed, tourism data and emissions inventories were not available for all destinations. To enable us to carry out comparisons, we were obliged to use hypotheses to compensate for missing data. This meant that we were unable to investigate some subjects, such as inter-sectoral comparisons and scenarios based on local planning documents. French Guyana had to be excluded from the study.

The emissions reduction target adopted in this study was a 40% decrease in CO<sub>2</sub> emissions by 2025. While this choice is justified as far as European requirements are concerned, this is an intermediary value that takes into account what countries are willing to accept and what they should accept to avoid dangerous climate change. In this respect, the Copenhagen negotiations will be decisive.

This study was presented at the conference, "*Du vert dans l'outre-mer*" (Going green in French overseas departments and territories), organised by the AFD in June 2009. The main objective of the study is to provide an initial overview of the issues facing tourism in the destinations studied. Indeed, one of the most important issues is raising awareness of the effects of GHG emissions and, in particular, those caused by tourism transport. Only in this way will representatives be able to choose appropriate mitigation measures. While our scenarios to 2025 are completely different to conventional visions of future tourism,<sup>35</sup> our hypotheses are still possible, and the final results are not catastrophic.

The most important barrier is making people accept that change is inevitable. They must accept that the future is likely to be far different to that which they expected or imagined. Accepting the carbon constraint is urgent if we wish to limit the effects of climate change and prevent irreversible damage to the environment, such as the death of coral reefs.

Strategically speaking, the time to take adaptation measures is now, especially if destinations wish to remain competitive. Strict regulations are inevitable if we wish to avoid catastrophic climate change. Therefore, for French overseas departments and territories, this study has four main advantages:

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<sup>35</sup> See scenarios for Reunion Island.

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- It contributes to building a knowledge base on tourism GHG emissions, an area previously unstudied.
- It uses an innovative methodology, which demonstrates how eco-efficiency can be an important decision-making tool.
- It helps raise awareness of the dangers in continuing to think along traditional lines.
- It outlines several possible solutions for emissions mitigation strategies.

This aim of this study was to investigate the current situation and produce an overview of major issues. The next step is to open up dialogue to the regions and local stakeholders concerned, paving the way for a joint strategy.

## Abbreviations and acronyms

ADEME : *Agence de l'Environnement et de la Maitrise de l'Energie* (French Environment and Energy Management Agency)

CCI : *Chambre de Commerce et d'Industrie* (Chamber of Commerce and Industry)

CITEPA : *Centre Interprofessionnel Technique d'Etudes de la Pollution Atmosphérique* (Interprofessional technical centre for atmospheric pollution studies)

DOM: *Département d'Outre-mer* (French overseas department)

GHG: greenhouse gas

IEOM : *Institut d'Emission de l'Outre-mer* (French overseas department and territory currency emission institute)

INSEE : *Institut National de la Statistique et des Etudes Economiques* (French national institute for statistics and economic studies)

IPCC: Intergovernmental Panel on Climate Change

ISEE : *Institut de la Statistique et des Etudes Economiques* (Institute for statistics and economic studies)

ISPF : *Institut de Statistiques de Polynésie Française* (French Polynesian statistical institute)

UNWTO : World Tourism Organization

VFR: visiting friends and relatives tourism

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