



## Air transport and carbon dependency: future outlook for Mediterranean tourist destinations

Since the end of World War II, international tourism has been revolutionised by the development of air transport. The world is now accessible, just a few hours away, at fairly cheap prices and this has shaped the way tourism has developed. However, air transport has also led to major environmental impacts. In 2008, tourism generated 1.3 billion tonnes of CO<sub>2</sub> emissions worldwide, accounting for 5% of total emissions. Air transport for tourism generated 515 million tonnes of CO<sub>2</sub>, 40% of the entire contribution of tourism.

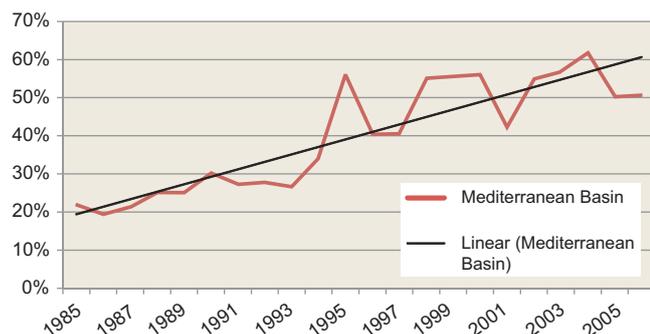
Plan Bleu carried out a prospective study “Management of energy: air transport and tourism in the Mediterranean”, in which various scenarios were modelled in order to estimate potential changes in tourist air transport by 2025 and 2050. Various proposals drawn from this study were honed on the basis of a case study of Djerba (Tunisia), with a focus on fully measuring the economic issues at stake for international tourist destinations in the event of the introduction of ambitious climate and energy policies

### Constant growth in tourism linked to air transport

Over the last twenty years, air transport has grown significantly in the Mediterranean region. Whereas in the late 1980s, it accounted for one quarter of international arrivals, its market share increased to more than half in 2006 (51%) (Figure 1).

In comparison, the proportion of visitors arriving by sea only increased by 2% over the same period, whereas the share of rail arrivals fell to one third of previous levels and arrivals by road were halved, from 60% to 30%.

Fig 1: Changes in the share of air travel in international arrivals in the Mediterranean



Source: UNWTO 2010

The carbon issues around international tourist travel is a formidable challenge. How can the constant growth in air transport for tourist travel be reconciled with the goal of an 80% worldwide reduction of greenhouse gas emissions by 2050?

### Greenhouse gas emissions chiefly in Northern Mediterranean countries

Over the same period, international tourists arriving in the Mediterranean Basin were mainly European guests (80% of international arrivals between 1985 and 2005).

Greenhouse gas emissions from tourist air travel in the Mediterranean remain much higher for inbound travel to the Northern shore (75% of total emissions), despite the significant growth in air travel by international tourists in Southern and Eastern Mediterranean Countries (SEMCs), with numbers doubling between 1999 and 2005.

### Difficult to control CO<sub>2</sub> emissions

The prospective study drew on a model referred to as MEDTOUR, created by the consultancy firm TEC (PEETERS 2010), in order to shed light on the “carbon” issues related to Mediterranean tourism. This model provided forecasts of the changes in tourist flows, on the basis of various combinations of prospective scenarios, to reflect the various options for

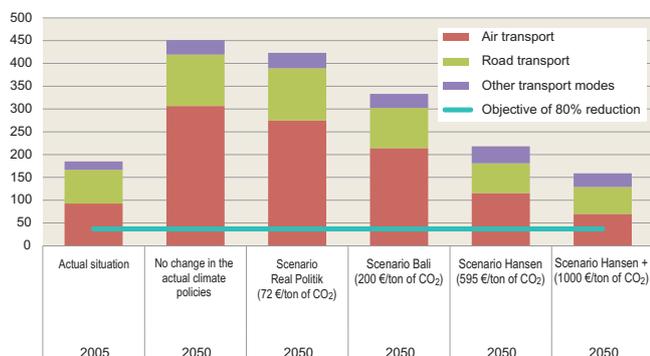
Fig 2: Schematic description of scenarios

	S1 Real Politik	S2 Bali	S3 Hansen S4 (variant)
<b>Overall policy Objectives</b>	Fragmented Copenhagen 2050 price of CO <sub>2</sub> : 72 €	Strong EU effort Obj. 2050/1991: -50 to 60 % NMC: Climate & energy package SEMC: 10-15 years deferment 200 €	Global policy, leadership ISA Obj. 2050/1990 : -80 % Choc sur les modes de vie 595 € 1000 €
<b>Tourism and air transport in climate change</b>	EUTS system for NMCs	Global carbon price, no special stipulations for air transport	Specific system for air transport, individual targets, sector-specific market
<b>Change in the sector</b>	Current trends (open-sky, low-costs airlines, etc.)	Current trends curbed in the medium term	Current trends reversed in the short term
<b>Infrastructures</b>	Partial/delayed Euromed transport planning	Modal integration, Euromed transport planning followed	Modal integration, TGV a priority, Euromed transport planning completed
<b>Technological developments</b>	No special stipulations	Introduction of turboprop aircraft	Turboprop aircraft, slower travel time
<b>Pace</b>	Slow progress	In stages, in ligne with international negotiations	Begun immediately

Source: Plan Bleu, TEC, 2010

climate and energy policy (carbon taxes, emissions quotas, market regulation strategies, etc.) on a national, regional and international scale (Figure 2)

Fig 3: Changes in CO<sub>2</sub> emissions levels based on different scenarios and economic contexts in the Mediterranean (in millions of tonnes)



Source: Plan Bleu, TEC, 2010

The results show that CO<sub>2</sub> emissions from tourism transport will remain difficult to control, regardless of the scenario tested. Even the most extreme scenario (scenario S4, in which carbon prices are projected to hit €1000 per tonne) would not lead to sufficient emissions reductions (Figure 3).

### Mediterranean tourist economy highly dependent on air transport

The difficulty in controlling future CO<sub>2</sub> emissions is mainly due to the importance of international clients to the Mediterranean tourism development model and the economic and demographic growth in the Southern and Eastern Mediterranean, which will mechanically increase demand. The economic performance of mass tourism destinations, in particular island destinations is directly dependent on air travel.

### Air transport: driving force for tourist development on islands

The growth of tourism on the island of Djerba (Tunisia) over the last thirty years is directly linked to the development of air travel (GAY 2006) and the presence of Tour Operators:

- the carrying capacity of the airport increased from 500,000 passengers per year in 1970 to 4,000,000 in 2008;
- in 2008, 95% of flights to Djerba were charters organised by Tour Operators.

Tourism-related revenue is particularly important, not only for the economy of Djerba, but also for Tunisia as a whole,

accounting for approximately one quarter of nationwide tourism revenue, or approximately 2% of GDP (tourism counts for 9% of Tunisian GDP in 2009).

### Economic repercussions of ambitious climate policy

Models of changes in the distribution of passengers by mode of transport show that air travel will continue to increase, regardless of the policy implemented, with the sole exception of the “enhanced Hansen” scenario, which is the strictest of all and leads to stagnation.

However, the implementation of strict climate policy would lead to the following economic consequences (Figure 4):

- reduced revenue from international tourism;
- increased revenue from domestic tourism;
- more significant reduction in revenue from international tourism in Southern and Eastern Mediterranean Countries.

### Proposals for adaptation

There are three possible ways to respond to the “carbon” issue, without jeopardising the economic performance of tourism: low-carbon international tourism, a more extensive and better-integrated transport offer and the development of domestic tourism.

### Better-integrated transport offer

While there is still a need for technical innovations or revolutions, a regional transport policy, meshing air travel with other modes of transport, should be developed.

This would initially require an ambitious infrastructure development project in the context of regional transport schemes, such as the Regional Transport Action Plan (RTAP) proposed by the European Union (EU). Subsequently, lower-carbon modes of transport need to be promoted for tourist transport. One example is the development of the “TGV Méditerranée” high-speed rail link in France, which reduced CO<sub>2</sub> emissions by 25% between 2000 and 2007 through a modal transfer from plane to train travel for the Paris-Marseille route.

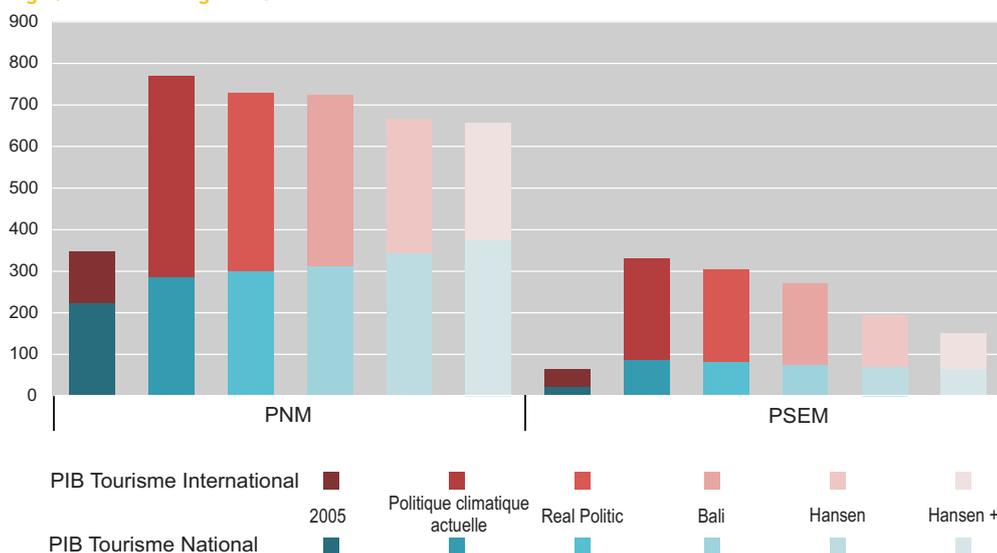
This would also require action to correct the competition between modes of transport by means of multi-party coordination (transport companies, tour operators, governments, international bodies, NGOs) in order to avoid air travel being systematically chosen when another mode is available. This strategy could also be accompanied with major restrictions in the use of air transport, for instance, limitations on the development of new airports and the implementation of high-speed rail links for routes of under 800 km<sup>1</sup> long.

The EU could play a key role in creating an integrated land

transport network, by developing high-speed rail across the entire EU territory to transport Northern European tourists to the Mediterranean coast. A process involving rail or coach solutions could be studied for initial/final leg transport where air travel is not strictly necessary; on each side of the Mediterranean and even eventually around the entire basin.

The promotion of railways would also offer a way of boosting domestic demand, particularly in SEMCs, where this segment is wrongly underestimated by market players in tourism.

Fig 4: Forecast changes in GDP from tourism from 2005 to 2050 in billions of euros



Source: Plan Bleu, TEC, 2011

### Lower-carbon international tourism

Options for reducing the CO<sub>2</sub> emissions of international tourism involve:

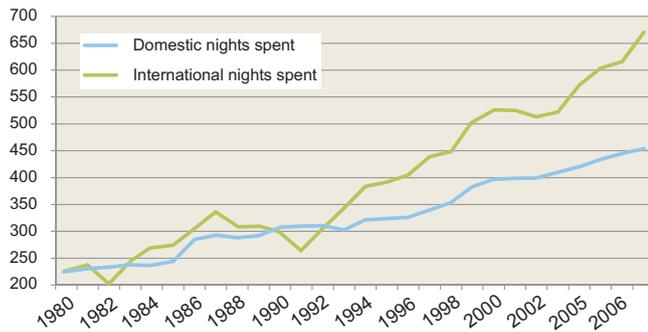
- optimising the passenger load factor (PLF) of each aircraft, which would reduce CO<sub>2</sub> emissions per passenger per kilometre;
- increasing the average length of stay (to improve CO<sub>2</sub> emissions per night).

### Promotion of domestic tourism in SEMCs

The domestic market has significant potential for growth, with the advantage of generally being able to use more environmentally-friendly land transport modes (train, coach) over shorter distances. In addition, in the context of a very strict climate policy, as in the “Hansen” scenario for example, an increase in domestic tourism would offset the fall in revenue from international tourism.

For SEMCs, diversifying the customer base towards the domestic market and neighbouring countries would not only be a way to widen the potential of the tourism sector. It is above all necessary in order to renew their clientele and prepare for demographic and social changes (growing middle class and expectation of holidays). Developing domestic tourism will also enhance resilience of the destinations in the face of stagnation in traditional markets.

**Fig 5: EChanges in numbers of international and domestic overnight stays in hotels and similar establishments in the Mediterranean (1980-2006, millions)**



Source: UNWTO, Plan Bleu, 2010

## Bibliographie

- Bernardie-Tahir, Nathalie (2005). Des « bouts du monde » à quelques heures : l'illusion de l'isolement dans les petites îles touristiques. *Annales de géographie* 644 (4): 362. doi:10.3917/ag.644.0362.
- Berriane, Mohamed (dir.) (2009). *Tourisme des nationaux, tourisme des étrangers : quelles articulations en Méditerranée ?* Rabat: Université Mohammed V. (Essais et Etudes, Vol. 41).

- Billé, Raphaël, Hubert Kieken, & Alexandre Magnan (2009). Tourism and climate change: challenges and prospects. In *Promoting sustainable tourism in the Mediterranean*. Athens: UNEP-MAP. (MAP Technical Report Series, n°173).
- Céron, Jean-Paul, Ghislain Dubois, & Louise de Torcy (2009). *Développement touristique de l'outre-mer et dépendance au carbone*. Marseille: TEC.
- Chapoutot, Jean Mohamed Mehdi (2011). *Profil de durabilité de la destination touristique Jerba - Tunisie*. Rapport final. Sophia Antipolis: Plan Bleu.
- Coudert, Elisabeth (2010). Les îles de la Méditerranée, des destinations vulnérables. *Revue Espaces et sociétés* (278): 14–15.
- Dubois, Ghislain, & Jean-Paul Céron (2009). Le monde est à nous ? Analyse socio-économique des émissions de gaz à effet de serre dues aux déplacements de tourisme et de loisirs. Programme de recherche GICC. Marseille: TEC.
- Gay, Jean-Christophe (2006). Transport et mise en tourisme du monde. *Cahiers de Géographie* (4): 11–22.
- Peeters, Paul (2010). *Gestion de l'énergie Transport aérien et tourisme en Méditerranée. Modélisation : méthodologie et sources de données*. Rapport final. Marseille.
- Tatar, Corina, Dehoorne, Olivier & Pascal Saffache (2008). Le tourisme international dans le monde : logiques des flux et confins de la touristicité. *Études caribéennes*, n°9-10, avril-août 2008. doi:10.4000/etudescaribeennes.882.
- TEC, PLAN BLEU (2010). *Gestion de l'énergie Transport aérien et tourisme en Méditerranée*. Rapport final. Sophia Antipolis: Plan Bleu.
- UNWTO, UNEP, WMO (2008). *Climate change and tourism: Responding to global challenges*. Madrid: UNWTO.

## Note

- <sup>1</sup> Given the average speed of an aeroplane (approx. 800-900 kph), the ratio of distance to travel time is very similar for a high-speed train and a plane (e.g. Paris-Marseille route in France).