



Information on the use of modulations of airport charges for environmental reasons

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Summary: Airport charges have a role to play in achieving environmental outcomes, which can only be defined in a local context

Using airport charges to help attain defined environmental purposes (environmental charging) is a vague and easily misinterpreted concept. For that reason, it is important to be precise about the various ways that an airport's charges for the provision of aeronautical services to airlines and passengers can contribute to achieving certain environmental outcomes.

Airport operators charge users to recover the internal costs of providing the airport infrastructure – from runways to access to the terminal from local roads. Recovering cost of providing aeronautical services includes the costs of making the infrastructure more environmentally sustainable or to reduce the carbon intensity of operations at the airport. Airport prices are set through consultation with users to maintain and attract airline customers, compete for traffic against other airports, to serve passengers as end-users, and ensure that air travel complements other modes of travel for consumers. In many cases, and especially at large airports, prices are monitored or regulated by a public authority.

Many airports modulate charges (increase/decrease) paid by airlines based on environmental criteria of the airlines' operation, for example noise from the aircraft and emissions with an impact on local air quality (NO_x or HC). Airports' ability to modulate charges depends on the applicable legislation which varies from country to country.

Modulations of airport prices are distinct from environmental charges. An environmental charge is a separate and specific charge or fee, linked to a certain impact, with the revenues from the charge ring-fenced by the airport or directly collected by the government. The most common charge is a noise charge or tax, applied per passenger or aircraft movement, the revenues of which are directed to fund noise mitigation measures.

Modulation of charges for environmental reasons is only one type of modulation possible. Other possible modulations are to ensure optimal use of capacity, to develop connectivity, to serve the public and general interest. Airlines and consumers benefit when airports have discretion in the categories of modulation applied.

1.

Airport charges provide for internal cost recovery in line with the “user-pays” principle to achieve environmental objectives

Airport chargesⁱ should recover the full costs of providing the aeronautical infrastructure and services, and should assure **application of the ‘user pays’** principle to recover the full internal costs of providing the aeronautical infrastructure. This ensures that economic signals for supply and demand efficiently drive toward correct environmental outcomes and provide resources for investment necessary to avoid congestion costs. If the ‘user pays’ principle is not applied, then airports’ ability to invest in environmental measures is compromised.

Given the salience of environmental issues generally, airport operators undertake operational cost measures and implement capital projects related to environmental protection, including noise monitoring and noise mitigation related activities or investment into solar photovoltaics onsite, just as two examples, all of which are part of the airport’s cost base. The associated costs need to be covered by airport charges.

Airport operators and investors stand ready to deliver the funding to meet customer, capacity and environmental improvement projects that will enable the aviation sector to meet future challenges - including achieving Net Zero carbon emissions, in line with the European Green Deal. This will be increasingly important as airports will have to support the deployment of Sustainable Aviation Fuels but also new aircraft technologies, including electrified aircraft or aircraft fuelled by hydrogen. These measures are key to help aviation reach Net Zero emissions. Providing the necessary infrastructure and associated services will require significant investments from airports. But policy makers and regulators need to ensure the right framework is in place to facilitate this essential investment.

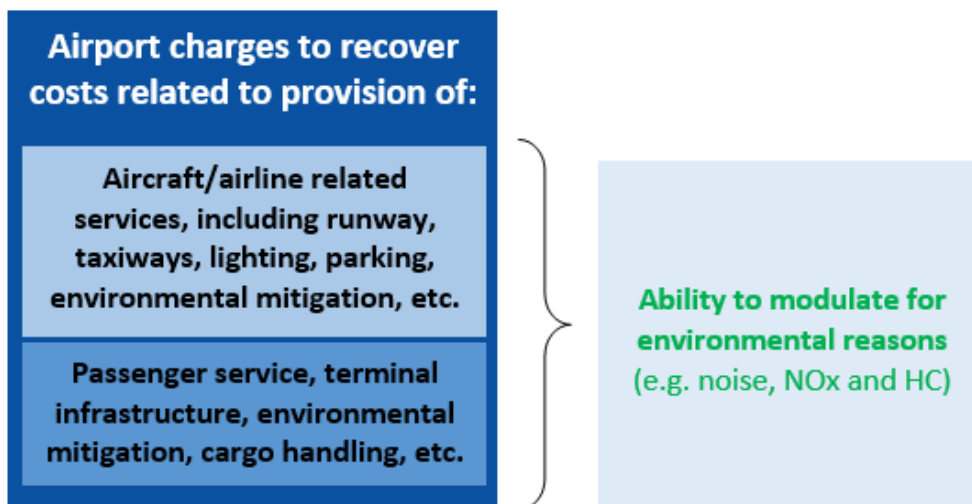
The overall level and direction of airports’ pricing for aeronautical services is directly linked to capital expenditures plans. Too often, airlines focus more on driving down airport charges, rather than on the benefits of the investment for airline operations, for passengers and for society.

Current practice in the general framework of economic regulation of airport charges (ICAO doc 9082 and EU Airport Charges Directiveⁱⁱ) requires that airports consult users on new infrastructure investment. Consultation takes place, whether required by regulation or not, as normal business practice, because most airports have only one or two big customers.

The most important feature of any economic regulation of airports that seeks to achieve environmental outcomes is:

- 1) Ensure that airports have the final decision in establishing an investment programme. Only the airport operator is appropriately placed to consider its investment plans, amongst the competing interests of various airlines operating at the airport, and the need to meet local public policy ambitions with airport projects.
- 2) Apply the 'user pays' principle so that the airport can recover the full internal cost of providing the aeronautical infrastructure, in line with environmental objectives, through airport charges.
- 3) Acknowledge that airport pricing aims at recovering the internal cost of the airport's scope of activities. This is especially pertinent as legislation differs in each country and for each airport.

Figure 1: General Framework: Modulations to achieve environmental outcomes



2.

Flexibility in pricing of aeronautical services maximises the potential for modulations to aid in the mitigation of environmental impacts

Noting point 1 above, airport charges principally are meant to recover costs of providing aeronautical services. ICAO for example lists categories for runway charges (landing and take-off), parking, lighting, airbridge, and passenger service, and suggests that revenues in each category should cover costs in that category. To require that the costs for lighting are directly covered by charges for lighting, or that the costs for the runway are covered only by revenue from charges for use of the runway, highly constrains the commercial strategy of an airport or the ability of an airport to modulate charges.

While airport charges are not primarily meant to deal with users' environmental performance, they can be used to nudge behaviours from users, with modulations designed in respect of the '*polluter pays*' basis.

Therefore, it is important that airport operators have **wide flexibility in setting charges, so that they can effectively use modulations**, within the overall level of charges, in a fair, non-discriminatory and revenue-neutral manner. This can be done to incentivise the use of less emitting or quieter aircraft by airlines, or operations during those times of the day where they create the least nuisance, in line with the principle that the one who pollutes most, pays most.

Modulations are revenue neutral. That is, a modulation may increase or decrease charges paid by an airline depending on the type of aircraft operated or other factors, but the overall total charges paid to the airport do not change. The total revenue from charges covers the airport's costs.

Subsections 2.1 – 2.2 describes commonly applied modulations, whereas section 2.3 discusses the possibility of a new type of modulation.

2.1 Modulations of landing charges for noise

A modulation of landing charges based on noise is part of the scheme of airport charges.

Local charges modulations respond to local problems and circumstances. It is not possible to have a 'standard' solution. Reasons that the noise-based modulation may need to vary include the geographical location of the airport, market served by the airport, customers of the airport, preferences of local communities, local political objectives and others. Experience has shown that noise modulations can achieve the objectives set out, for example retrofitting of aircraft operating at an airport to produce lower noise nuisance.ⁱⁱⁱ

Modulation can be based both on certification (recommended by ICAO) and operational data, i.e. based on noise measurements (current practice at some airports). ICAO provides detailed classifications on aircraft types and their noise categories (ICAO Annex 16, Chapters 2, 3, 4 and 14). ICAO also provides information on modulations of airport landing and take-off charges based on noise in its Policies on Charges (doc 9082).

Airports may also use the ACI World Noise Rating Index to define modulations for noise charges, recognising that the modulation needs to be appropriate for the specific local objectives desired.

Noise Charges are different from Noise Modulations of Airport Charges

In some circumstances, an independent and fully separate noise-related charge, with the funds utilised to cover costs of noise monitoring and reporting and any noise abatement measures in the local area, may be appropriate. A noise charge finances specific mitigation activity, such as noise insulation in homes. This aspect is not further elaborated in this paper, as it is outside the scheme of airport charges.

2.2 Modulations of landing charges for pollutants with impact on local air quality: HC and NOx

The ERLIG (Emissions Related Landing Charges Investigation Group), formed after introduction of first local emissions modulations in Switzerland and Sweden, developed in 2000 a standardised model focused on local emissions impacting local air quality (LAQ), specifically hydrocarbon (HC) and nitrogen oxides (NOx). The model was based on the approach that "the one who pollutes most pays most." Experience has shown that modulations can achieve the objectives set out for pushing change in the aircraft fleet operating at an airport to aircraft with engines that produce lower emissions impacting local air quality.^{iv}

The work was further expanded at the European and ICAO level. The following documents provide specific reference data, methods and calculations that can help airport operators define modulations:

- European Civil Aviation Organisation (ECAC) recommendation 27-4 on a NOx emission classification scheme^v
- ICAO document 9884, the Guidance on Aircraft Emissions Charges Related to Local Air Quality

As an example of practices, some authorities have benchmarked various forms of modulations used:

- UK CAA, Environmental charging – Review of impact of noise and NOx landing charges: update 2017^{vi}

2.3 Modulations of landing charges for emissions with impact on global climate: CO₂

Modulations of airport charges are currently being used to address local environmental impacts at airports, due to local policies and requirements. Global environmental impacts, mainly resulting from CO₂ emissions of aircraft operations, have been out of the scope of modulations so far.

CO₂ emissions from aircraft operations have a global impact and are not under direct control of the airport operator. Therefore, they do not fall into the internal cost base of airports. Consequently, charging airline operators for their CO₂ emissions is not in line with the cost recovery principle of airport charges. However, because it is revenue-neutral for the airport, a modulation of airport charges could be envisaged for the CO₂ emissions from aircraft in order to incentivise airlines to use 'greener' aircraft at the airport and to act as another lever for airports to help ensure the industry grows sustainably.

That being said, there are challenges to such a modulation which must be addressed:

- *Legality*: There is some uncertainty about the compliance of such a measure with the provisions of the Chicago Convention. It is the view of ACI EUROPE that such a modulation would not be perceived as an indirect tax on fuel, because it is revenue-neutral for the airport, and unlike a tax, not generating any additional cost for users.
- *Trade-offs with other modulations*: Incentivising CO₂ reductions may cut across incentives which incentivise lower noise or local pollutant emissions reductions. For instance, some aircraft engines can produce less NO_x but more CO₂ emissions. Modulating airport charges based on CO₂ emissions could thus limit the ability of the airport to use effective modulations to reduce local environmental impacts which are its primary responsibility.
- *Availability of CO₂ performance data*: There is for now no standardised, certified CO₂ emissions data for aircraft which could be used to establish a precise and widely accepted comparison of aircraft CO₂ performance as basis for modulation mechanisms based on CO₂. ICAO has introduced an aeroplane CO₂ emissions standard in 2016, but it is entering into force gradually. As of 2020, it only applies to new aircraft types, while all in-production aircraft will need to be certified according to it at the latest by 2028. It should be noted though that approximations are currently used, and airports are accustomed to calculate CO₂ emissions for the landing and take-off (LTO) cycle, using a methodology and engines fuel flow factors communicated by ICAO (same database than the NO_x emission factors).
- *Overlapping measures*: In Europe, CO₂ emissions from aircraft are addressed by the EU Emissions Trading System (for flights within the European Economic Area) and as of 2021, the growth in emissions from international flights will be covered by the ICAO Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Therefore, a CO₂-based modulation of airport charges can be perceived as overlapping with the above mechanisms, especially for those airlines for which it will result in an increase of their charge compared to others, and may face complaints that it is discriminatory. A modulation of airport charges is automatically revenue neutral. This ensures that it does not result in an additional cost for the total of airline users at the airport.

These challenges to implementing a modulation of airport charges based on aircraft CO₂ emissions must be fully considered.

3.

Ability to use additional financial measures to achieve wider decarbonisation goals

There are other financial incentives for airline decarbonisation that airports can implement without encountering the challenges related to modulation. There are some examples of existing practice in this area.

- 1) London Heathrow has announced that the first electric-hybrid aircraft will not have to pay Heathrow's landing charges, a cost-saving for that aircraft operator valued at nearly £1 million.^{vii} Avinor and Stuttgart Airport have announced similar initiatives.^{viii} This type of specific programme is not a 'modulation of airport charges' in the published charges, but rather a 'prize incentive' to support research, development & deployment.
- 2) The Danish Aviation Industry Association has proposed creating an independent Climate Foundation. Instead of a government tax, a small fee would be added per passenger flying from a Danish airport. In total, the Climate Foundation could contribute DKK 250-300 million annually to initiatives aimed at more climate-friendly aviation.^{ix}
- 3) Another way for airports to provide financial incentives to reduce CO₂ emissions from the aircraft is to cover a part of cost premium for the use of Sustainable Aviation Fuels (SAF). Such a mechanism is for instance implemented by Swedavia through its Sustainable Aviation Fuel Programme, which allows airlines to apply for an up to 50% coverage of the cost premium by Swedavia, for SAF uplifted at one of its airports.^x

4.

Implementation & Outcomes

Engagement with regulators and users on environmental modulations

When developing and implementing modulations, consultation and engagement with stakeholders will help to obtain support. Airport experience has demonstrated that even when providing lengthy advance engagement, some users can still be surprised when informed of the final charges modulations. Civil aviation authorities and other governmental authorities welcome regular provision of information.

At most large airports or those that possess market power, governments have put in place economic regulation^{xi}. It is best that any regulation aims to facilitate discussion between airlines and the airport. This ensures fair, reasonable and non-discriminatory charges, while allowing the airport operator flexibility to adjust charges so that it can achieve environmental objectives.

Airports have a societal obligation as well as business and economic rationales to pursue efficiencies that lower environmental impact. This means that airports have good reason to decrease or increase charges to certain types of use, as a way of incentivising economically and environmentally efficient use of the airport infrastructure.

The straightforward and most efficient way to ensure that airport charges achieve desired environmental outcomes is to firstly guarantee that users cover the full costs of providing airport services, within a competitive airport marketplace. This also relates to costs incurred by airports to reduce the environmental impact of their infrastructure and services and support the decarbonisation of aircraft operations. Secondly, sufficient flexibility to allow for effective modulations needs to be provided.

Regulation should focus on enabling airports to invest to meet their own decarbonisation commitments and ensuring that airports fully cover the cost of providing aeronautical services through airport charges. European airports should seek to put in place revenue-neutral modulations of charges, in a transparent and non-discriminatory manner, to help accelerate change in associated parts of the air transport system, including to reduce noise and emissions from aircraft.

Notes

ⁱ Airport charges are the pricing of landing & take-off, parking & lighting for aircraft and use of the passenger terminal facility for passengers. The EU Airport Charges Directive (2009/12) defines airport charges as: “a levy collected for the benefit of the airport managing body and paid by the airport users for the use of facilities and services, which are exclusively provided by the airport managing body and which are related to landing, take-off, lighting and parking of aircraft, and processing of passengers and freight.”

ⁱⁱ Directive 2009/12/EC of the European Parliament and of the Council of 11 March 2009 on airport charges <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0012>;
ICAO's Policies on Charges for Airports and Air Navigation Services, Doc 9082, Ninth Edition – 2012
http://www.icao.int/publications/Documents/9082_9ed_en.pdf

ⁱⁱⁱ Targeted modulations to address specific and known noise problems (for example the unique issue of noise with Airbus A320 family of aircraft) have motivated airlines to perform the technical retrofit to reduce the noise from that aircraft. This was the experience of London Gatwick Airport where 97% of the Airbus A320 family aircraft, had been modified to reduce noise, just within a year of the introduction of a related modulation in 2018, and the same performance at Frankfurt Airport in 2012.

^{iv} This was the experience of Zurich Airport after the introduction of an emissions-based modulation. For instance, movements with aircraft with least emitting engines have increased from 60% (1997) to 85% (2009). It also spurred the development of new engines, for example by Pratt & Whitney.

^v European Civil Aviation Organisation (ECAC) recommendation 27-4 on a NOx emission classification scheme, https://www.ecac-ceac.org/documents/10202/75621/Rev_Sept11_ECAC_Rec_27_4+%283%29.pdf/dcc95bcb-a1d0-4185-9695-003bf470f533

^{vi} See for instance UK CAA, Environmental charging – Review of impact of noise and NOx landing charges: update 2017, CAP 1576, July 2017, <https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=7995>

^{vii} Heathrow Airport, <https://www.heathrow.com/latest-news/first-electric-aircraft-at-heathrow-airport-wont-pay-landing-fees-for-a-year>

^{viii} Avinor: “All domestic air transport in Norway electrified by 2040”, <http://www.airport-business.com/2019/06/avinor-domestic-air-transport-norway-electrified-2040/>
Stuttgart Airport, <https://www.flughafen-stuttgart.de/newsroom/pressebereich/pressemitteilungen/2019/stuttgart-airport-first-german-airport-to-offer-free-landing-charges-to-electric-aircraft-and-to-fund-electricity-based-fuels/>

^{ix} Copenhagen Airport, <https://www.cph.dk/en/cph-business/aviation/copenhagen-connections/sustainability-how-is-the-aviation-industry-adapting>

^x Swedavia, <https://www.swedavia.com/globalassets/flygmarknad/swedavia-saf-incentive-2020.pdf>

^{xi} Most airports lack any market power [Oxera 2017, *Increasing Airport Competition in Europe*, Copenhagen Economics 2016, Market Power of German Airports, Copenhagen Economics 2012, *Airport Competition in Europe*, etc.] Airports that have some market power already have their prices controlled by an independent supervisory authority. Airports do not charge more than their economic cost and would not find it effective to do so, because excessive prices would reduce demand and raise the threat of regulatory intervention. Therefore, increasing prices through the addition of an environmental charge would violate the principle of cost-relatedness and in many cases harm the competitive position of the airport.