State and Federal Regulations That May Affect Initiatives to Reduce Airports' GHG Emissions

DETAILS

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I. INTRODUCTION

Over the last few years, airport managers have expressed increasing interest in undertaking greenhouse gas (GHG) mitigation measures to address the climate change effects of airport activities. This interest stems from a variety of motivations, including concerns about the long-term sustainability of the aviation industry; the potential for mandatory regulation of airport activities in the future; the existing policies of state, county, or municipal entities; growing interest from airlines and other tenants; and the leadership of airport staff and boards.

However, initiatives to implement GHG-mitigation measures at airports are complicated by layers of legal uncertainty, including the lack of any comprehensive federal climate change legislation, uncertainty regarding the reach of state legislation, and existing federal aviation regulations and guidance that did not contemplate climate change issues when originally drafted. Further complications arise from the fact that the vast majority of airport emissions come from aircraft, ground service equipment (GSE), and ground access vehicles that are not owned or operated by airports.

This digest introduces airport management and staff to legal issues that are relevant to implementing GHG-mitigation measures at airports. As part of this effort, the authors of the digest have coordinated with the team that developed Airport Cooperative Research Program (ACRP) Report 56, *Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports*,[1] which provides an extensive menu of 125 GHG-reduction measures for airports. ACRP 56 evaluates each measure for its practicality, considering factors such as capital cost, return on investment, and GHG-reduction potential. This digest complements that effort by analyzing many of those same measures from a legal perspective. Section IV of the digest, which contains the measure-by-measure analysis, is organized into the same 12 categories that are used in ACRP 56:[2]

- Airfield Design and Operations.
- Business Planning.
- Construction.
- Carbon Sequestration.
- Energy Management.
- Ground Service Equipment.
- Ground Transportation.
- Materials and Embedded Energy.
- Operations and Maintenance.
- Performance Measurement.
- Renewable Energy.
- Refrigerants.

GHG-mitigation measures for airports involve legal issues that range from the familiar (such as preemption of aviation-related regulation and Federal Aviation Administration (FAA) grant assurances) to the less familiar (such as energy regulation). This digest focuses on issues that are peculiar or especially important to *airports*; it does not address, except through brief reference, general contract, tort, or other issues that could arise in any development or management context.

The digest is organized into three main sections. Section II describes the various sources of GHG emissions that are generated from airport-related activities. Section III summarizes the federal, state, and local laws that are most likely to be implicated in the implementation of various GHG-mitigation measures at airports. Section IV explains how these laws may apply to the implementation of specific GHG-mitigation measures described in ACRP 56, including actual and hypothetical examples.

This digest is intended for airport attorneys, managers, and staff; elected officials; regulatory agencies; and others interested in this topic. The digest is not intended to provide any legal or policy recommendations. What may be considered prudent, feasible, cost effective, and appropriate at one airport may not be at another. The digest is intended for general information purposes only and does not contain legal advice applicable to any particular airport.

II. AIRPORT SOURCES OF GREENHOUSE GAS EMISSIONS

To put legal issues associated with GHG-reduction efforts into context, it is useful to briefly review how airports and airport-related activity affect climate change. Many of the legal issues associated with airport GHG emissions revolve around the physical sources of the GHG emissions, along with who owns or operates them. The vast majority of airport-related emissions come from sources that are not directly owned and con-

[1] http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_056.pdf.

[2] Like any categorization system, the approach from ACRP 56 and reported in this digest involves a number of judgment calls and has some overlap among categories. Some measures could qualify for inclusion in multiple categories, but by necessity are reported in one.

trolled by airports, increasing the legal complexity of addressing them.

A. Airport and Aviation Contribution to Climate Change

Recent scientific evidence strongly suggests a connection between climate change and increasing atmospheric concentrations of GHGs such as carbon dioxide (CO_2), methane, tropospheric ozone, and nitrous oxide. Many GHGs are naturally occurring, but human activity has substantially increased the amount of GHGs in the atmosphere. There is a scientific consensus identified by the National Academies and others that climate change represents a threat to the environment and human welfare and that recent warming trends have been driven by anthropogenic activity.[3]

In the United States, the primary sources of anthropogenic GHG emissions are related to the production and use of energy.[4] Energy use and production account for approximately 86 percent of total U.S. anthropogenic GHG emissions on a CO_2 equivalent basis.[5] The combustion of fossil fuels creates the vast majority of energy-related emissions.[6]

The five largest categories of U.S. sources of GHG emissions from fossil fuel combustion are electricity generation, transportation, industry, residential, and commercial. In 2008, combustion of fuel for transportation and electricity generation for the transportation sector (including airport-related electricity consumption) together accounted for approximately 27 percent of U.S. GHG emissions.[7]

Aviation-related activities produce about 3 percent of total U.S. GHG emissions.[8] However, aviation's contribution to air pollutant concentrations nationwide is expected to increase with forecasted growth of the sector in coming decades.[9] The FAA estimates that the annual number of passengers in the United States will increase from 750 million in 2012 to over 1 billion by 2023.[10] FAA also forecasts a 20 percent increase in the number of flights over the same period.[11]

Although technology advancements can be expected to improve the environmental performance of the aviation sector in the long term, the long cycles of aircraft technology development and fleet turnover mean that it takes approximately 10 to 15 years for fleet-average fuel efficiency to catch up with the efficiency of the newest aircraft.[12] Absolute GHG emissions from the aviation sector are expected to increase in the future; conservative estimates project that by 2025, aircraft GHG emissions will increase by 60 percent.[13]

B. Airport Sources of GHG Emissions

Airports contain a wide variety of sources of GHGs, including aircraft, GSE, ground access vehicles, and heating and cooling facilities. Airports also consume energy, products, and services that create GHGs. For example, airports use considerable quantities of electricity that is often generated through the combustion of coal or gas.

Unsurprisingly, the direct combustion of fossil fuels in aircraft engines creates the majority of GHG emissions from the aviation sector. The largest proportion of aircraft engine emissions (70 to 90 percent) occurs at higher altitudes rather than at ground level or near airports.[14]

Other airport support activities also generate GHGs. Such activities include, but are not limited to, operation of GSE; use of ground access vehicles such as buses, taxis, and passenger vehicles; energy use at facilities; construction, including construction equipment operations and energy embedded in construction materials; waste handling, such as incineration of international waste or recycling; and the escape of refrigerants to the ambient air.

As of 2008, no national or state laws required airport operators to prepare GHG emissions inventories,[15] and

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[3] JOINT SCIENCE ACADEMIES' STATEMENT: GLOBAL RESPONSE TO CLIMATE CHANGE (2005), *available at* http://nationalacademies.org/onpi/06072005.pdf (signatories are the National Academies of Brazil, Canada, China, France, Germany, India, Italy, Japan, Russia, the United Kingdom, and the United States); Naomi Oreskes, *Beyond the Ivory Tower: The Scientific Consensus on Climate Change*, 306 SCIENCE, Dec. 3, 2004, at 1686, http://www.sciencemag.org/content/306/5702/1686.full.pdf.

[4] U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2008,at 3-1 (2010), *available at* http://www.epa.gov.climatechange/ghgemissions/usinventoryreport.html.

[5] *Id.* Many substances other than carbon dioxide act as GHGs. Carbon dioxide equivalency values compare the global warming potential of different GHGs, such as methane or nitrous oxides, to make comparisons and additions possible. EPA, Glossary of Climate Change Terms, http://www.epa.gov/climatechange/glossary.html (last visited June 6, 2012).

[6] U.S. ENVIRONMENTAL PROTECTION AGENCY, *supra* note 4.

[7] Calculated from Table 3-1 and total net U.S. GHG emissions of 6,014 Tg CO_2 in 2008. *Id.* § 2.1, tbl. 3-1.

[8] *Id.*

[9] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-10-50, AVIATION AND THE ENVIRONMENT: SYSTEMATICALLY ADDRESSING ENVIRONMENTAL IMPACTS AND COMMUNITY CONCERNS CAN HELP AIRPORTS REDUCE PROJECT DELAYS 8 (2010), http://www.gao.gov/new.items/d1050.pdf.

[10] *Id.* at 1.

[11] *Id.*

[12] FEDERAL AVIATION ADMINISTRATION, AVIATION AND EMISSIONS: A PRIMER 19, http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/aeprimer.pdf (2005).

[13] *Id.* at 10.

[14] *Id.* at 2.

[15] AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, REPORT 11, GUIDEBOOK ON PREPARING AIRPORT GREENHOUSE GAS EMISSIONS INVENTORIES 1 (2009), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf.

the first specific guidance for airports related to the development of GHG emissions inventories was only issued in 2009.[16] Accordingly, airport emissions inventories have generally been undertaken voluntarily, although sometimes at the behest of state or local authorities or in response to state-level environmental impact review requirements.[17]

New regulations promulgated by the Environmental Protection Agency (EPA) mandate emissions reporting from stationary sources (like power plants or heating and cooling plants) that generate more than 25,000 tons of GHGs per year.[18] In 2010, five airports reported their emissions to EPA.[19]

Some of the airport-specific GHG emissions inventories that have been conducted in the United States include the following:

- 2009 San Diego International Airport Criteria Pollutant and Greenhouse Gases Baseline Emissions Inventory.[20]
- 2009 Sacramento County Greenhouse Gas Emissions Inventory.[21]
- 2008 Westchester County Airport Air Emissions Inventory.[22]
- 2006 Port of Seattle Aviation Division Greenhouse Gas Inventory.[23]
- 2005 City and County of Denver Greenprint Denver Climate Initiative, including Denver International Airport.[24]

It is difficult and probably not useful to conduct detailed comparisons of airports using these inventories, as they were prepared using different methodologies, at different times, involving different-sized airports in different parts of the country.

However, two basic conclusions can be drawn from existing airport inventories that provide useful background for this digest. First, the overwhelming majority of emissions associated with airports come from aircraft that airports neither own nor operate. At each of the five inventoried airports, aircraft emit more than 60 percent of airport GHG emissions. At all airports other than the Westchester County Airport, aircraft are responsible for more than 80 percent of airport GHG emissions. The variation between Westchester County and the other examined airports is likely attributable to the fact that the Westchester County inventory examined only aircraft emissions that occurred below 3,000 ft above ground level, whereas other airports also considered emissions generated above 3,000 ft.

Second, among the other categories of emissions sources, the relative proportions differ based on local conditions and methodologies. For example, emissions attributable to electricity use at terminals and other facilities will differ between Seattle and Denver due to the manner in which electricity is generated. A kilowatt hour in the Northwest produced with a high proportion of hydropower will have a much lower GHG profile than a kilowatt hour in the West or Midwest produced predominantly from coal. Additionally, ground access vehicle emissions will depend significantly on the length of average trips to the airport and how many people use multi-occupant vehicles or public transportation.

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[16] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 9, at 34; TRANSPORTATION RESEARCH BOARD, *supra* note 15.

[17] *Id.*

[18] EPA, Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009); 40 C.F.R. pt. 98, http://www.epa.gov/climatechange/emissions/downloads09/GHG-MRR-Full%20Version.pdf. *See* § III.A.4 for further discussion.

[19] EPA GHG Data, 2010 Greenhouse Gas Emissions from Large Facilities, http://tinyurl.com/74vwtve (last visited June 6, 2012).

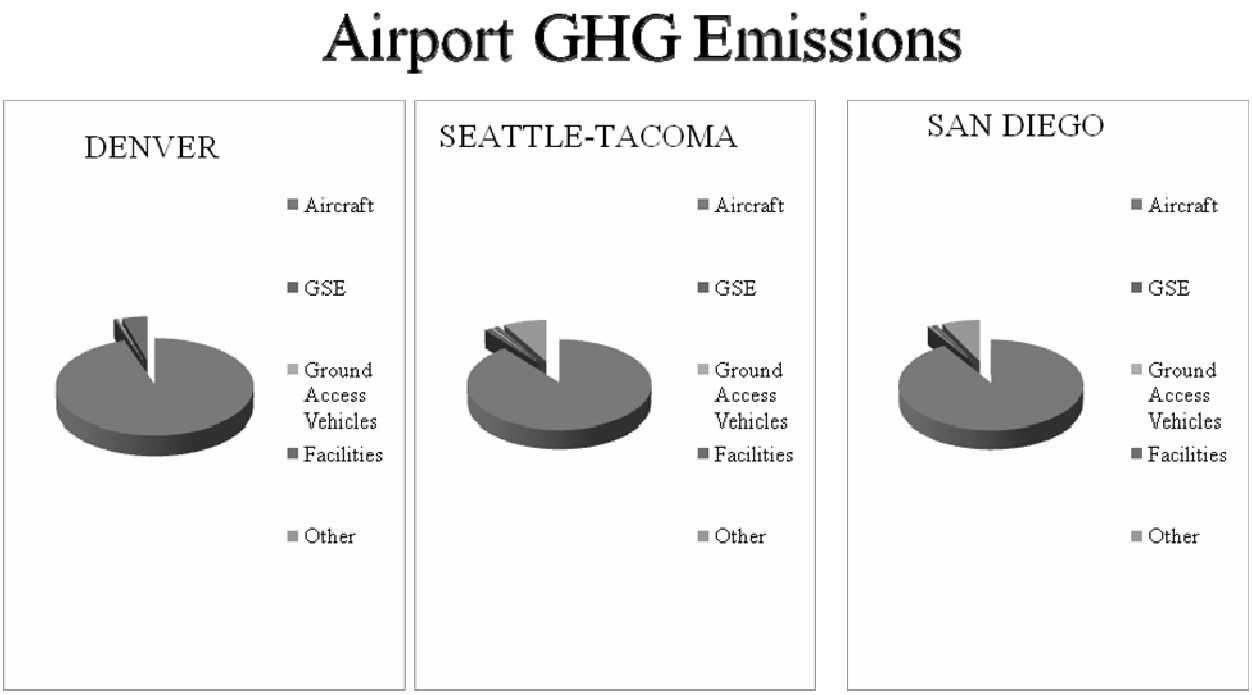
[20] San Diego International Airport, Air Quality Management, http://www.san.org/sdcraa/airport_initiatives/environmental/air_quality.aspx (last visited June 6, 2012).

[21] SACRAMENTO COUNTY DEPARTMENT OF ENVIRONMENTAL REVIEW AND ASSESSMENT, GREENHOUSE GAS EMISSIONS INVENTORY FOR SACRAMENTO COUNTY (2009), *available at* http://www.airquality.org/climatechange/SAC_GHG_InventoryJune09.pdf (last visited June 6, 2012).

[22] WESTCHESTER COUNTY AIRPORT, WESTCHESTER COUNTY AIRPORT AIR EMISSIONS INVENTORY (2008), *available at* http://www.westchestergov.com/jairport/pdfs/air_emissions_inventory.pdf (last visited June 6, 2012).

[23] PORT OF SEATTLE, SEATTLE-TACOMA INTERNATIONAL AIRPORT GREENHOUSE GAS EMISSIONS INVENTORY–2006 (2007), *available at* http://www.airportattorneys.com/files/greenhousegas06.pdf (last visited June 17, 2012).

[24] MAYOR'S GREENPRINT DENVER ADVISORY COUNCIL, CITY OF DENVER CLIMATE ACTION PLAN (2007), *available at* http://www.greenprintdenver.org/about/climate-action-plan-reports/ (last visited June 6, 2012).



Accordingly, airports have largely eschewed one-size-fits-all approaches to GHG control, instead tailoring measures to their local legal, political, technical, and economic climates. The range of GHG control measures identified in ACRP 56 and Section IV reflects this diversity. This collection of measures represents a toolbox rather than a prescriptive blueprint.

C. Airport Ownership and Operating Control Over Sources

One of the most important elements in developing GHG inventories and control plans is categorizing the degree of ownership or control that the airport has over various sources. This is important for legal and practical purposes because an airport generally will have more ability to influence emissions from sources it owns and operates, including its own vehicles and buildings. ACRP guidance suggests that, when producing GHG inventories, airport proprietors should consider and indicate whether or not they have control or influence over an emissions source, or if the source is beyond the airport's control.[25] This can help to avoid unrealistic expectations about an airport's ability to reduce emissions from all sources.[26]

ACRP guidance and GHG emissions inventory methodologies frequently refer to three categories of emissions sources, based on ownership and control:

- Scope One: Direct emissions—emissions from sources that are owned and controlled by the reporting entity.
- Scope Two: Indirect emissions—emissions from the generation of purchased electricity consumed by the entity.
- Scope Three: Indirect and optional emissions—emissions that occur as a consequence of the activities of the entity, but occur at sources owned and controlled by another party.

Scope Three includes the emissions from tenants such as airlines and general aviation operators, private fixed-base operations, flight kitchens, cargo operations, and maintenance facilities, as well as cars, trucks, buses, and other vehicles accessing airports. Typically, Scope Three would contain the majority of airport emissions because it includes aircraft emissions, which dominate airport emissions inventories.[27]

This delineation approach is helpful, but imperfect. It reflects one way of looking at the difficulty of achieving emissions reductions from sources not owned or operated by the airport. However, it does not account for all of the regulatory and proprietary powers that airports can use to influence emissions from nonowned sources. Airports have a mix of proprietary and regulatory powers—exercised through leases, minimum standards, regulations, permits, and other tools—that can

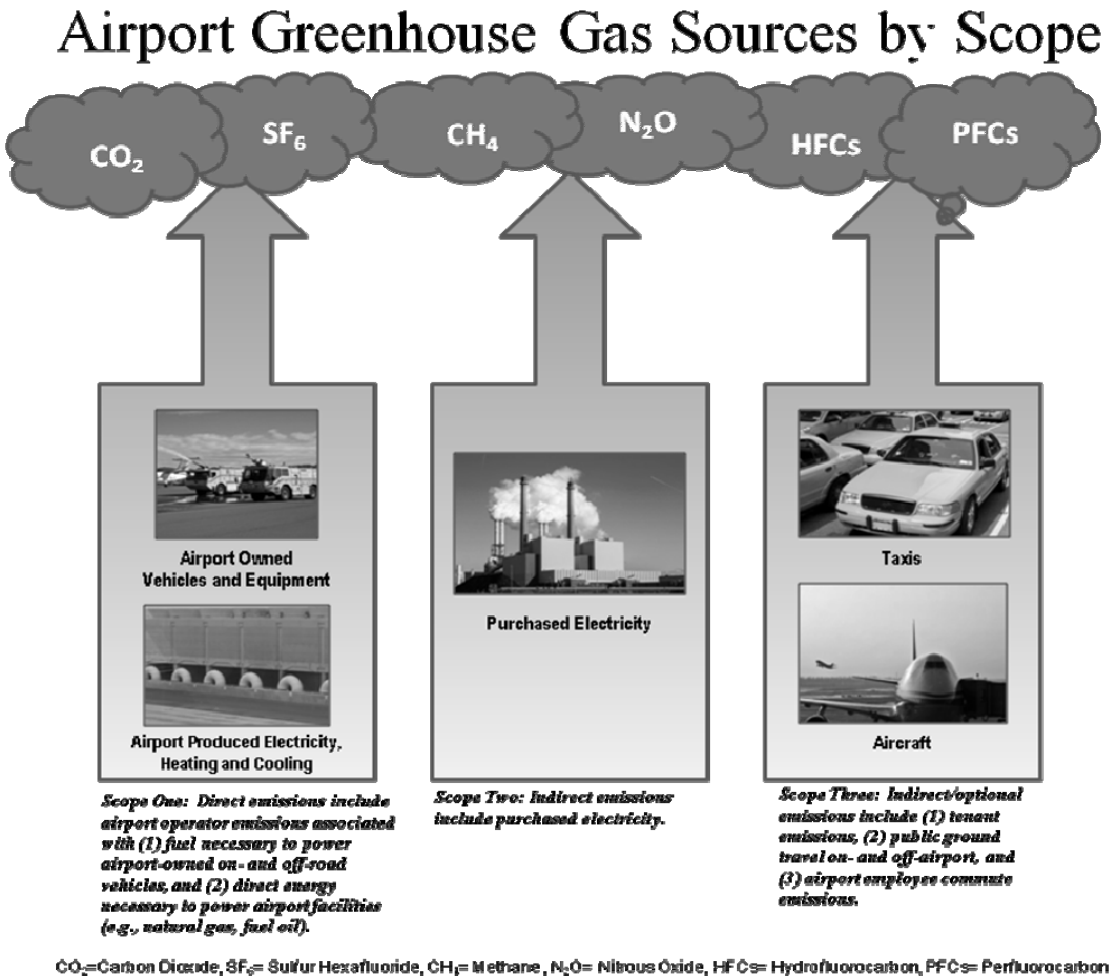
[25] TRANSPORTATION RESEARCH BOARD, *supra* note 15 § 2.2 (2009), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf.

[26] Daniel S. Reimer & John E. Putnam, *The Law of Aviation-Related Climate Change: The Airport Proprietor's Role in Reducing Greenhouse Gas Emissions*, 2 AIRPORT MANAGEMENT 88–89, 93 (2007), http://www.airportattorneys.com/files/JAM ClimateChangeArticle.pdf.

[27] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 15, at 14.

be used to influence emissions from the wide variety of Scope Three sources. At the same time, federal and state laws (as discussed in Section III) preempt the scope of some of these airport powers in ways that vary based on the source. For example, even though aircraft emissions and airline-controlled building emissions both can fall within Scope Three, airports have a much greater ability to control emissions from tenant buildings on an airport than emissions from aircraft operating at an airport.

It is also critical to consider that the categorization of sources will often vary from airport to airport. While most electricity consumed at airports comes from offsite sources and, thus, is considered in Scope Two, some airports generate electricity at cogeneration and other facilities that would be considered in Scope One. Similarly, while GSE often fall into Scope Three, some airports own and control ground handling, fixed-base operator (FBO), or other operations that would qualify for Scope One treatment. Accordingly, it is necessary to carefully consider the unique circumstances present at any given airport as part of the planning and legal assessment of GHG control measures.



III. LEGAL REQUIREMENTS OR OBLIGATIONS THAT CAN AFFECT AIRPORTS' EFFORTS TO REDUCE GHG EMISSIONS

This section identifies laws, cases, and regulations that can affect the ability of airports to implement GHG-mitigation projects or the manner in which such projects are implemented. It does not identify or discuss every possible law in every jurisdiction, but rather identifies the most important categories of laws affecting airport efforts to undertake GHG reduction efforts.

A critical theme throughout this section is the effect that federal preemption has on the regulatory and proprietary power of airports to control aviation activity and sources of emissions owned and operated by parties other than the airport proprietor. Although the majority of GHG emissions come from aircraft, vehicles, and engines operated by others, the federal Clean Air Act (CAA), federal aviation laws, and other provisions restrict the ability of airports to control these sources directly. Nonetheless, airports retain a number of tools to influence emissions through incentives, assistance, and restrictions.

Other restraints on airport activities arise from federal restrictions on the use of airport revenue and property. While many GHG-related efforts are perfectly appropriate under revenue use provisions, more questions and greater risks arise where the nexus between GHG-reducing activities and aeronautical activities is attenuated.

Further, some GHG-related activities trigger a range of permitting and other requirements from federal, state, and local governments. Many of these activities and regulatory requirements are similar to or encountered during typical airport development and will be familiar to airports, while others may be unique to electric power or other nonairport projects.

A. Federal Clean Air Act

The CAA[28] is a complicated and far-reaching piece of federal legislation. It relies on a delicate balance of state or local regulation of some sources and federal regulation of others. In particular, mobile sources like aircraft, cars, and trucks are subject to substantial federal regulation. For mobile sources with national and international markets, the CAA preempts certain regulatory activities by state and local entities to prevent the balkanization of rules and requirements for manufacturers and users. Some of these requirements limit the ability of airports or other actors to regulate GHG sources at airports.

1. Federal Preemption of Regulation of Mobile Emissions Sources

The CAA affects airports' and state and local entities' abilities to act in their regulatory capacity to regulate emissions from aircraft, motor vehicles, and other mobile sources. Because the vast majority of emissions associated with airports come from mobile sources, the CAA's provisions regarding preemption in this area are critical to airports' abilities to address GHG emissions. As a general rule, airports have greater latitude under the CAA to impose or encourage the adoption of GHG-reduction measures when acting in their proprietary capacity than in their regulatory capacity. However, the scope of that proprietary role in the context of vehicle/aircraft emissions has not been well defined by the courts.

a. Aircraft or Aircraft Engines.—Section 233 of the CAA preempts any state or local regulation "respecting emissions of any air pollutant from any aircraft or engine thereof" unless the regulation is identical to federal regulations.[29] Both the U.S. Supreme Court and EPA have found that GHGs constitute "air pollutants" under the CAA.[30] Thus, states and local entities may not promulgate an emissions standard for aircraft unless such standard is identical to a federal standard.

However, EPA has not yet promulgated a GHG emissions standard for aircraft.[31] In 2008, several states and environmental groups filed petitions seeking to compel EPA to regulate GHG emissions of aircraft, marine vessels, and other nonroad vehicles.[32] EPA subsequently issued an Advanced Notice of Proposed Rulemaking regulating aircraft nitrogen oxide emissions, which are not GHG emissions.[33] Dissatisfied, petitioners brought suit arguing that EPA was statutorily required to make a finding regarding whether GHGs from aircraft endanger public welfare and, therefore, require regulation.[34] The federal district court agreed with petitioners, and it allowed the lawsuit to proceed with regards to aircraft engines.[35] Because the CAA contains no hard deadline to make the endangerment finding, it will be up to the court to determine whether EPA is proceeding at a reasonable pace. The future regulations are expected to be consistent with standards that may be developed by the International Civil Aviation Organization.

In the absence of EPA regulations, it is unclear whether states and localities are allowed to develop laws regarding GHG emissions of aircrafts. A Ninth Circuit Court of Appeals case from 1980 may provide some guidance. In that case, the court interpreted the

[28] Pub. L. No. 88-206, 77 Stat. 392, 42 U.S.C. ch. 85.

[29] 42 U.S.C. § 7573.

[30] Massachusetts v. EPA, 549 U.S. 497, 127 S. Ct. 1438, 167 L. Ed. 2d 248 (2007); EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).

[31] Control of Air Pollution from Aircraft and Aircraft Engines, 40 C.F.R. pt. 87 (2011).

[32] Ctr. for Biological Diversity v. U.S. E.P.A., 794 F. Supp. 2d 151, 153 (D.D.C. 2011).

[33] *Id.*

[34] *Id.*

[35] *Id.* at 158, 162 (2011).

scope of Section 233 as not "preclusive of all state regulations in the field of aircraft engines."[36] The court adopted a test to determine whether state regulations were preempted: if "state pollution regulations can be met without affecting the design, structure, operation, or performance of the aircraft engine," then the state regulations are not preempted.[37] Accordingly, the court upheld the California regulations because such emissions limits could be met through abatement measures outside of the engine itself, such as by modifying test cell smoke stacks.[38] Although there still might be some room for state and local regulation of aircraft engines, the scope of preemption suggested by this case appears to be sweeping. Moreover, the case did not address the extent to which airports' proprietary powers (discussed below at Section III.A.1.d) would be affected by CAA preemption.

b. Motor Vehicles and Motor Vehicle Engines.—The CAA also preempts state or local regulation of the emissions from new motor vehicles or new motor vehicle engines, with a limited exception for the State of California.[39] CAA Section 209(a) provides:

> No State or any political subdivision thereof shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines subject to this part. No State shall require certification, inspection, or any other approval relating to the control of emissions from any new motor vehicle or new motor vehicle engine as condition precedent to the initial retail sale, titling (if any), or registration of such motor vehicle, motor vehicle engine, or equipment.[40]

California has been granted a limited exception to the CAA Section 209(a) preemption; it may set its own motor vehicle emissions standards that are at least as tough as federal standards. [41] However, California must receive a waiver of preemption from EPA prior to enforcing its regulations.[42] EPA will grant a waiver unless it finds that California's standards are not necessary to meet extraordinary and compelling circumstances or that they are not consistent with Section 202(a), which provides federal emissions standards for new motor vehicles and engines.[43] Other states may enforce the California standards, but their standards must be identical to those of California.[44]

Section 209(a) preemption affects the ability of states and localities to adopt regulations affecting on-road motor vehicles in operation at airports. Examples of on-road vehicles in use at airports include GSE and operations/maintenance vehicles using on-road equipment (such as pickup trucks, lavatory, or catering trucks using "street legal" vehicles as a base) and private vehicles, taxis, or vans used in the transport of employees or passengers to airports. As discussed immediately below, courts have considered Section 209(a) requirements in a variety of contexts and have found that they have a wide scope of applicability.

State-Level Manufacturing and Sales Mandates Affecting GHG Emissions from New Motor Vehicles or New Motor Vehicle Engines

In 2002, the California Legislature enacted a law requiring the California Air Resources Board (CARB) to develop GHG emission standards for vehicles in model years 2009 and beyond.[45] Two years later, CARB adopted regulations establishing a pair of standards for GHG emissions, one for new passenger cars and small trucks and one for new larger trucks.[46] The regulations called for preliminary standards to be phased in from 2009 to 2012, with more stringent standards taking effect from 2013 to 2016.[47] Over a dozen states subsequently adopted GHG standards identical to California's.

As required by the CAA, California petitioned EPA for a waiver to allow it to implement its proposed automotive GHG standards. Under the Administration of President George W. Bush, California's waiver request was denied.[48] However, in 2009, President Barack Obama directed EPA to reassess its decision to deny California's waiver application.[49] After accepting additional comment, EPA published a notice in July 2009 granting California's waiver request.[50]

Subsequent to the adoption of federal automotive GHG emissions standards, discussed below at Section III.A.3.b, California initiated a rulemaking to permit compliance with its standards based on compliance with

[36] California v. Dep't of the Navy, 624 F.2d 885, 888 (9th Cir. 1980).

[37] *Id.*

[38] *Id.* at 888–89 (9th Cir. 1980).

[39] 42 U.S.C. § 7543(a)–(b).

[40] *Id.* § 7543(a).

[41] *Id.* § 7543(b).

[42] *Id.* § 7543(b).

[43] *Id.* § 7543(b).

[44] *Id.* § 7507.

[45] CAL. ASSEM. B. 1493, PAVLEY. VEHICULAR EMISSIONS: GREENHOUSE GASES (2002) (enacted), http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab_1451-1500/ab_1493_bill_20020722_chaptered.pdf.

[46] California Air Resources Board (CARB), California Exhaust Emissions Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles (Mar. 12, 2010) (incorporated by reference in CAL. CODE REGS. tit. 13, §§ 1960.1(k), 1961(d) (2011)).

[47] *Id*.

[48] California State Motor Vehicle Pollution Control Standards: Notice of Decision Denying a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 73 Fed. Reg. 12,156 (Mar. 6, 2008).

[49] White House, State of California Request for Waiver under 42 U.S.C. 7543(b), the Clean Air Act, 74 Fed. Reg. 4905 (Jan. 26, 2009).

[50] California State Motor Vehicle Pollution Control Standards: Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 74 Fed. Reg. 32,744 (July 8, 2009).

federal GHG emissions standards.[51] In accordance with the identicality requirements of the CAA, other states that have adopted California's regulations must generally revise their standards to match California's.[52]

Although airports and other local governments do not have the authority to adopt manufacturing or sales mandates affecting GHG emissions from motor vehicle fleets on their own, external GHG emissions standards may reduce the emissions impact of airport motor vehicle use.

State- and Local-Level Purchasing Mandates Affecting New Motor Vehicles or New Motor Vehicle Engines

In *Engine Manufacturers Association v. South Coast Air Quality Management District (EMA I),*[53] the U.S. Supreme Court considered the validity of a number of rules promulgated by a Los Angeles-area air quality agency (the District) that required certain public and private fleets to buy only those vehicles meeting emissions standards that were stricter than federal or federally-approved engine standards.

The District's Rule 1194 was of interest to area airports because it required both public and private airport ground access fleet operators, such as limousine or transit service operators, to acquire a specified percentage of vehicles that met CARB's standards for low-emission vehicles.[54] Airport transportation fleet operators purchasing and leasing heavy-duty vehicles, such as shuttle buses, were directed to acquire alternative-fuel vehicles, defined as vehicles "not powered by gasoline or diesel fuel."[55] The airport fleet purchasing requirement applied regardless of whether the private fleets were under public contract.

The District argued that the fleet regulations, including Rule 1194, were not preempted by the CAA because the requirements related to the *purchase* of vehicles by fleet owners rather than the *sale* of vehicles by manufacturers or retailers. The U.S. Supreme Court rejected this contention and adopted a sweeping definition of emissions standards:

> A command, accompanied by sanctions, that certain purchasers may buy only vehicles with particular emission characteristics is as much an "attempt to enforce" a "standard" as a command, accompanied by sanctions, that a certain percentage of a manufacturer's sales volume must consist of such vehicles. We decline to read into § 209(a) a purchase/sale distinction that is not to be found in the text of § 209(a) or the structure of the CAA.[56]

The Supreme Court did not address whether some of the fleet rules that applied to purchases by local governments, as opposed to private operators, would be excepted from preemption. The Supreme Court remanded the case to the lower courts to consider 1) "the scope of petitioner's challenge"; 2) "whether some of the Fleet Rules…can be characterized as internal state purchase decisions…."; and 3) "whether § 209(a) preempts the Fleet Rules even as applied beyond the purchase of new vehicles (e.g., to lease arrangements or to the purchase of used vehicles)."[57]

On remand, the district court held that the fleet rules were not preempted because they fell into the market participant exception.[58] The case was then appealed to the Ninth Circuit.[59] As discussed below in Section III.A.1.d., the Ninth Circuit affirmed, holding that the fleet rules as applied to state and local governments were outside the scope of preemption because they fell into the market participant exception.[60] The court reasoned that state governments have the ability to order their own affairs and those of their subdivisions in a way that differs from their rights to impose mandates on private entities.

In addition to affirming the market participant issue, the Ninth Circuit remanded the remaining provisions of the fleet rules to the district court to determine whether they were preempted. In 2008, the district court and the parties entered a stipulated entry of judgment containing the court's determination that the fleet rules were not preempted insofar as they directed the decisions of state and local governments, as well as private entities under state and local contracts.[61] However, the court did determine that the fleet rules were preempted insofar as they attempted to direct the decisions of Federal Government entities and private entities not under state contract.[62]

State Regulation of In-Use Operations for Motor Vehicles or Motor Vehicle Engines

CAA Section 209(d) also provides that "[n]othing in this part shall preclude or deny to any State or political subdivision thereof the right otherwise to control, regulate, or restrict the use, operation, or movement of registered or licensed motor vehicles."[63] This is referred to as the "in-use" exception to preemption. Examples of "in-use" requirements include "carpool lanes, restrictions on car use in downtown areas, and programs to

[51] CARB, *supra* note 46.

[52] 42 U.S.C. § 7507.

[53] Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist. (EMA I), 541 U.S. 246, 124 S. Ct. 1756, 158 L. Ed. 2d 529 (2004).

[54] *Id.* at 249.

[55] *Id.* at 250 n.2 (internal citations omitted).

[56] *Id.* at 255.

[57] *Id.* at 258–59.

[58] Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist., 2005 WL 1163437, at *13 (C.D. Cal. 2005) (not reported).

[59] *Id.*

[60] Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist., 498 F.3d 1031, 1039 (9th Cir. 2007).

[61] Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist., No. 00-9065 FMC (C.D. Cal. Feb. 7, 2008) (stipulated entry of judgment).

[62] *Id.*

[63] 42 U.S.C. § 7543(d).

control extended idling of vehicles."[64] Therefore, state and local authorities may be able to adopt in-use motor vehicle regulations at airports. For example, a locality might prohibit engine idling in airport vehicle waiting areas. Denver is an example of a jurisdiction that imposes such a requirement, including on the Denver International Airport.

c. Nonroad Engines or Vehicles.—Nonroad engines in operation at an airport include construction equipment and GSE that are not "street legal," including aircraft pushback tugs, baggage loaders, generators, snow plows, loaders, tractors, air-conditioning units, and cargo-moving equipment.[65]

Section 209(e) of the CAA generally preempts state or local regulation of emissions from nonroad engines or vehicles, with an exception for certain California regulations and other states' regulations that are identical to California's.[66] For "new engines which are used in construction equipment or vehicles or used in farm equipment or vehicles and which are smaller than 175 horsepower," the CAA provides that "no State or any political subdivision thereof shall adopt or attempt to enforce any standard or other requirement relating to the control of emissions."[67] For other nonroad engines, the CAA provides that EPA may authorize California to impose "standards and other requirements relating to the control of emissions" under specific conditions.[68] Other states with nonattainment or maintenance plans in place may adopt identical standards, so long as they provide 2 years of lead time.[69]

Generally, courts have interpreted the CAA's nonroad preemption provisions in a similar way to those applicable to on-road engines; that is, to prevent states and local entities from acting in their regulatory capacity to force the purchase or sale of engines cleaner than federal or federally-approved standards. However, the reach of the California exception from the nonroad preemption provision is broader than that of the on-road provision because the CAA authorizes California to regulate both existing and new nonroad emissions sources provided that certain conditions (i.e., waiver) have been met.[70]

The EPA interprets the CAA to extend the Section 209(d) allowance of in-use requirements to regulation of nonroad engines.[71] An EPA interpretive rule provides that "EPA believes that states are not precluded under Section 209 from regulating the *use and operation* of nonroad engines, such as regulations on hours of usage, daily mass emission limits or sulfur limits on fuel…." [72] The precise limits of this power to regulate in-use emissions are not settled, but EPA's interpretation indicates that states (and their subdivisions) may adopt some in-use limitations on emissions from nonroad vehicles without running afoul of preemption under the CAA. The full reach of this power in terms of possible restrictions on GSE use has not been established.

An EPA waiver of CAA preemption is required where nonroad engine limitations contain restrictions on the quantity of certain pollutants emitted by particular classes of engines. In 2008, the Ninth Circuit ruled that nonroad engine emissions limitations that may be met through in-use requirements are invalid where they are framed as requirements that engines "not emit more than a certain amount of a given pollutant" and have not been approved by EPA.[73] The court found that such rules were emissions standards that could not be enforced without EPA authorization.[74] Where California has obtained EPA approval for similar standards, such as it did for in-use regulations relating to nonroad transport refrigeration units operating in California, the D.C. Circuit has upheld such regulations.[75]

EPA approval of California's regulations is essential to the state's ability to enforce in-use nonroad regulations specifying emission performance standards. In 2007, CARB proposed extensive regulations limiting nitrogen oxide and particulate matter emissions for in-

[64] Engine Mfrs. Ass'n v. EPA, 88 F.3d 1075, 1094 (D.C. Cir. 1996); s*ee also* 42 U.S.C. § 7408(f) (requiring administrator to make available to state and local authorities information relating to such strategies).

[65] *See* 42 U.S.C. § 7550(10).

[66] 42 U.S.C. § 7543(e).

[67] *Id.*

[68] *Id.* at § 7543(e)(2).

[69] *Id.* at § 7543(e)(2)(B).

[70] Engine Mfrs. Ass'n v. EPA, 88 F.3d 1075 (D.C. Cir. 1996) (holding that implied preemption provision of CAA authorizing California to adopt emission standards for nonroad sources that are not expressly preempted applies to new and used nonroad sources).

[71] Air Pollution Control, Preemption of State Regulation for Nonroad Engine and Vehicle Standards, 59 Fed. Reg. 36,969, 36,973–74 (July 20, 1994)

> (Further indication that section 209(e)(2) was not intended to apply to in-use regulations is the fact that, if the subsection were applied to in-use regulations, then California would be the only government (local, state or federal) that could directly set regulations for nonroad engines in use. EPA's mandate under section 213 applies only to new engines.).

[72] Control of Air Pollution, Determination of Significance for Nonroad Sources and Emission Standards for New Nonroad Compression-Ignition Engines At or Above 37 Kilowatts, 59 Fed. Reg. 31,306, 31,339 (June 17, 1994); 40 C.F.R. pt. 89, subpt. A, app. A (emphasis added). *See* Engine Mfrs. Ass'n v. EPA, 88 F.3d 1075, 1094 (D.C. Cir. 1996) (upholding EPA's rule in this regard).

[73] *See* Pac. Merch. Shipping Ass'n v. Goldstene, 517 F. 3d 1108, 1115 (9th Cir. 2008) (finding California regulations relating to auxiliary engines on oceangoing ships to be preempted under CAA § 209, even if the standard could be met using cleaner fuels, because the plain language of the rules regulated emissions from ship engines by requiring that engines "not emit more than a certain amount of a given pollutant." (quoting Engine Mfrs. Ass'n v. SiCoast Air Quality Mgmt. Dist., 541 U.S. 246, 253)).

[74] Pac. Merch. Shipping Ass'n v. Goldstene, 517 F.3d 1108, 1115 (9th Cir. 2008).

[75] Am. Trucking Ass'ns v. EPA, 600 F.3d 624 (D.C. Cir. 2010).

use nonroad diesel-fueled fleets and off-road large spark-ignition engines, including airport GSE.[76] The in-use nonroad diesel regulations impose limits on idling, buying older vehicles, and selling off-road vehicles.[77] Beginning in 2010, users of nonroad equipment were to begin cleaning up their fleets to meet fleet average-emissions requirements through replacement, repowering, and retrofitting.[78]

In 2008, CARB sought EPA approval to enforce these rules.[79] As of early 2012, EPA had not approved California's request for a CAA preemption waiver related to its retrofit requirements for nonroad vehicles. Thus, California has yet to begin enforcement of the regulatory fleet average-emissions requirements.[80] However, the state is enforcing the regulatory in-use requirements relating to idling, reporting, labeling, and sales disclosures.[81] In December 2011, CARB adopted amendments to these rules in response to the California Legislature's request that CARB consider the impact of the recession and resultant emissions inventory changes on the rule.[82]

CARB has plans to implement several other emission-reduction programs targeting in-use fleets—including some airport GSE—such as an air toxic control measure for portable engines and new emission standards and fleet requirements for forklifts and other industrial equipment.[83]

State-Level Regulations Affecting GHG Emissions from Nonroad Vehicles or Nonroad Vehicle Engines

At the time of this digest's preparation, California had yet to adopt rules limiting GHG emissions from nonroad vehicles.

d. Market Participant Exception.—As noted above, a critical question is whether an action by an airport in its proprietary role as airport operator is covered by the CAA's preemption of regulation. This question has not been definitively resolved, but cases applying the market participant doctrine in the CAA and other contexts suggest that there is room for exercise of proprietary power that may exceed regulatory powers.

The U.S. Supreme Court originally established the market participation doctrine in dormant Commerce Clause cases, in light of "considerations of state sovereignty, the role of each State as guardian and trustee for its people, and the long recognized right of trader or manufacturer, engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal."[84] The Court established that "in market participant cases, courts undertake 'a single inquiry: whether the challenged program constituted direct state participation in the market.'"[85] The doctrine recognizes that "[n]ot all actions by state or local government entities…constitute regulation, for such an entity, like a private person, may buy and sell *or own and manage property in the marketplace*."[86] Accordingly, where a federal statute preempts state regulation in a particular field, state action in that field "is not preempted so long as it is proprietary rather than regulatory," absent congressional indication to the contrary.[87]

Two Ninth Circuit cases provide particularly helpful case law on understanding the market participant exception. In *Engine Manufacturers Association v. South Coast Air Quality Management District (EMA II)*,[88] the Ninth Circuit held that the state rules fell into the market participant exception, saving them from preemption under CAA Section 209. *EMA II* addressed whether the state could mandate state and local entities' fleets (as opposed to private fleets) to procure cleaner vehicles than required under federal or EPA-approved California minimum emissions standards. The court found that "the section contains nothing to indicate a congressional intent to bar states from choosing to use their own money to acquire or use vehicles that exceed the federal standards."[89] This exception to Section 209 preemption is similar in many ways to the proprietor's exception in federal aviation law, discussed at Section III.B, although the exception does not have the same explicit statutory basis.

In *EMA II*, the Ninth Circuit set forth two tests for market participation: the efficient procurement test and the narrow scope test.

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[76] In-Use Off-Road Diesel Vehicle Regulation, *available at* http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm (last visited June 12, 2012).

[77] Regulatory Advisory 10-414: Enforcement of the In-Use Off-Road Diesel Vehicle Regulation (May 2011), http://www.arb.ca.gov/enf/advs/advs414.pdf.

[78] *Id.*

[79] *Id.*

[80] *Id.*

[81] *Id.*

[82] Notice of Public Hearing to Consider Proposed Amendments to the Regulations for In-Use Off-Road Diesel-Fueled Fleets and Off-Road Large Spark Ignition Engine Fleet Requirements 3 (Oct. 19, 2010), *available at* http://www.arb.ca.gov/regact/2010/offroadlsi10/offroadlsinotice.pdf.

[83] Ground Support Equipment (GSE) (Sept. 2, 2009), http://www.arb.ca.gov/msprog/offroad/gse/gse.htm (last visited June 12, 2012).

[84] Reeves, Inc. v. Stake, 447 U.S. 429, 438–39, 100 S. Ct. 2271, 2278, 65 L. Ed. 2d 244, 252 (1980) (internal citations omitted); *see also* Hughes v. Alexandria Scrap Corp., 426 U.S. 794, 809–10, 96 S. Ct. 2488, 2498, 49 L. Ed. 2d 220, 231 (1976).

[85] Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist. (EMA II), 498 F.3d 1031, 1040 (9th Cir. 2007) (quoting Reeves, Inc. v. Stake, 447 U.S. 429, 435 n.7 (1980)).

[86] Sprint Spectrum L.P. v. Mills, 283 F.3d 404, 417 (2d Cir. 2002) (emphasis added).

[87] *Engine Mfrs. Ass'n,* 498 F.3d at 1041; *see also* Bldg. & Constr. Trades Council v. Associated Builders & Contractors, 507 U.S. 218, 231–32, 113 S. Ct. 1190, 1198, 122 L. Ed. 2d 565, 579 (1993).

[88] *Engine Mfrs. Ass'n,* 498 F.3d at 1031.

[89] *Id.* at 1043.

> First, state action is proprietary if it "essentially reflect[s] the [governmental] entity's own interest in its efficient procurement of needed goods and services, as measured by comparison with the typical behavior of private parties in similar circumstances." 463 F.3d at 1084 (quoting [*Cardinal Towing & Auto Repair, Inc. v. City of Bedford,* 180 F.3d 686, 693 (5th Cir. 1999)]). In these circumstances, the market participant doctrine "protects comprehensive state policies with wide application from preemption, so long as the type of state action is essentially proprietary." *Id.* Second, state action is proprietary if "the narrow scope of the challenged action defeat[s] an inference that its primary goal was to encourage a general policy rather than address a specific proprietary problem." *Id.* (quoting *Cardinal Towing*, 180 F.3d at 693). Thus, the doctrine also "protects narrow spending decisions that do not necessarily reflect a state's interest in the efficient procurement of goods or services, but that also lack the effect of broader social regulation." *Id.*[90]

The court rejected a suggestion that the California rules did not meet the "efficient procurement" test because they considered emissions alongside price and performance, rather than price or performance alone.[91] According to the Ninth Circuit, "'efficient procurement' means procurement that serves the state's purposes—which may include purposes other than saving money—just as private entities serve their purposes by taking into account factors other than price in their procurement decisions."[92] The court pointed to evidence that FedEx and UPS "have, for their own purposes, adopted programs to introduce less-polluting vehicles into their fleets."[93] Finally, the Ninth Circuit determined that the "market participant doctrine's protection of state proprietary action includes proprietary action by states' political subdivisions."[94]

An unresolved question is the extent to which airports can potentially use the market participant exception for local regulation to address GHG emissions from tenants' vehicles. It will be essential for airports to tie their initiatives to the self-interested operation of the airport as an enterprise, rather than to frame them as attempts to solve regional or global problems. Specifically, tying airport policies to specific regulatory requirements, liabilities, or other considerations is safer than tying them to general efforts to address climate change.

A recent case analyzing the market participation exception under the Federal Aviation Administration Authorization Act (FAAA Act) provides useful guidance. In 2011, the Ninth Circuit decided *American Trucking Association v. City of Los Angeles*.[95] At issue in that case were various provisions of the Port of Los Angeles's Clean Trucks Program, which had been enacted to address concerns that the proposed expansion of its cargo terminal would increase air pollution.[96] Under that program, motor carriers could not operate drayage trucks—trucks that move cargo from marine terminals to customers, railroad, or other trucks for long distance transport—without a concession agreement.[97] The American Trucking Association challenged the State's actions, arguing that they did not qualify as "efficient procurement" and were therefore preempted by federal law.[98] Specifically, the association challenged the provisions requiring concessionaires to 1) transition away from using independent contract drivers, 2) address local parking regulations in an off-street parking plan, 3) maintain trucks according to manufacturers' specifications, 4) attach to their trucks placards with a phone number to report emission concerns, and 5) demonstrate financial capability to comply with the concession agreement.[99]

Although "the Port does not purchase drayage services [because] such services are an integral part of Port business," the court held that "when an independent State entity manages access to its facilities, and imposes conditions similar to those that would be imposed by a private landlord in the State's position, the State may claim the market participation doctrine."[100] Thus, the Port "acted in its proprietary capacity, as a market participant, when it…entered into concession agreements."[101] However, the court did not save every provision of the concession agreement from preemption.[102] The employee-driver provision, requiring concessionaires to gradually cease using independent owner-operators for Port drayage, did not fall under the market participant exception because it "seeks to impact third party behavior unrelated to the performance of the concessionaire's obligations to the Port" and is "tantamount to regulation."[103]

American Trucking Association sheds additional light on airports' ability to use the market participant exception to take actions that address GHG emissions. The considerations here are similar to those discussed above. Based on *American Trucking Association,* the more integral a part of airport business the action is, the more likely it is to be viewed as proprietary rather than regulatory.

e. Summary of Federal Preemption of Regulation from Mobile Emissions Sources.—Under the CAA, local governments cannot directly limit GHG emissions from aircraft, such as by specifying the amount of GHGs that could be emitted per flight. The CAA would also likely preempt efforts by an airport to restrict use of the air-

[90] *Id.* at 1041.

[91] *Id.* at 1045–46.

[92] *Id.* at 1046.

[93] *Id.* at 1047.

[94] *Id.* at 1041–45.

[95] Am. Trucking Ass'ns, Inc. v. City of L.A., 660 F.3d 384 (9th Cir. 2011).

[96] *Id.* at 390.

[97] *Id.*

[98] *Id.* at 399.

[99] *Id.* at 394.

[100] *Id.* at 401.

[101] *Id.* at 402.

[102] *Id.*

[103] *Id.* at 408.

port by certain aircraft based on their GHG emissions.[104] In addition, airports cannot use their police power to directly regulate emissions from new motor vehicles or nonroad vehicles (such as baggage-handling vehicles) used at the airport. However, airports can choose to purchase fleets of alternative-fuel or low-emissions vehicles. They may also be able to use their proprietary powers to require the use and purchase of low-emissions equipment by their tenants and permittees. In addition, the CAA probably does not preempt airports from imposing certain restrictions on the operation or use of GSE, such as requiring cleaner fuels, imposing idling restrictions, or the like.

2. Regulation of Emissions from Indirect Sources

An important, although little used, exception to CAA preemption is state and local authority to regulate "indirect sources" of emissions, an area traditionally in the local domain of land-use control.[105] For the purposes of this exception, the CAA defines an indirect source as:

> a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution. Such term includes parking lots, parking garages, and other facilities subject to any measure for management of parking supply (within the meaning of subsection (c)(2)(D)(ii) of this section), including regulation of existing off-street parking but such term does not include new or existing on-street parking.[106]

The authority of states to regulate indirect sources is codified in Section 110(a)(5) of the CAA, which allows the inclusion of "any indirect source review program" in a State Implementation Plan.[107] Such programs may include measures "as are necessary to assure, or assist in assuring, that a new or modified indirect source will not attract mobile sources of air pollution, the emission of which would cause or contribute to air pollutant concentrations" exceeding or preventing maintenance of national ambient air quality standards.[108]

The Ninth Circuit recently upheld the San Joaquin Valley Unified Air Pollution District's enactment of regulations limiting emissions from construction equipment at certain developments, finding the regulation of mobile sources at indirect sources permissible because the emissions reductions required of construction equipment were regulated by reference to the development site rather than by reference to the construction equipment in use.[109] The court rejected the contention that Section 209 of the CAA preempted the District's regulation of nonroad sources at the site.[110]

Like the development sites at issue in the San Joaquin Valley, airports could be characterized as indirect sources. Indeed, the CAA makes clear that EPA has the authority to promulgate indirect source regulations at federally assisted or owned airports.[111] There is no case law that addresses the ability of 1) state or local entities to impose indirect source requirements on airports (for GHGs or traditional pollutants), or 2) the ability of airports to set indirect source limits on tenants.

3. EPA and Other Federal Regulation of GHGs from Mobile Sources

Airports should also keep abreast of EPA and other federal efforts to reduce GHG emissions. EPA efforts may reduce the need for or value of airport-specific initiatives. There is also some potential for conflict or tension between federal and local efforts that could drive up costs or create concerns for airports or airport stakeholders. EPA and FAA initiatives could also lead to new regulatory obligations for airports.

a. Climate Change Legislation.—The U.S. House of Representatives passed climate legislation in 2009; legislation was considered, but not adopted, by the Senate in 2010. The proposals considered by Congress centered on a cap-and-trade program. In a cap-and-trade program, a government establishes a limit or "cap" on the total pollution that can be emitted for a certain jurisdiction. In this case, the program would apply to emissions produced in the United States. The total emissions under the cap are divided into emissions permits and issued to certain polluting entities. These entities are required to hold a quantity of permits that represents the equivalent of their pollution levels. If an entity does not have enough permits to cover its own pollution, it can implement pollution reduction measures or it can "trade" by purchasing permits from another entity. The government cannot issue permits beyond the cap, thereby limiting actual emissions in the jurisdiction to the target level.

The United States is unlikely to see a national cap-and-trade program in the near future. Since Congress considered the proposals in 2009 and 2010, the prospects of climate legislation have diminished considerably. However, Congress could still consider utility-sector-specific legislation.

Even when passage of a comprehensive climate bill seemed possible, proposed legislation did not consider airports to be industrial sources that should be covered under a cap-and-trade program.[112] Neither the climate change legislation passed by the House of Representatives in 2009 nor the Senate bills considered during 2010 would have changed the CAA's provisions regard-

[104] Reimer & Putnam, *supra* note 26, at 88–89.

[105] Nat'l Ass'n of Home Builders v. San Joaquin Valley Unified Air Pollution-Control Dist., 627 F.3d 730, 737–38 (9th Cir. 2010) (citing Manchester Envtl. Coal. v. EPA, 612 F.2d 56, 58 (2d Cir. 1979)).

[106] 42 U.S.C. § 7410(a)(5)(C).

[107] *Id.* at § 7410(a)(5)(A)(i).

[108] *Id.* at § 7410(a)(5)(D).

[109] Nat'l Ass'n of Home Builders v. San Joaquin Valley Unified Air Pollution-Control Dist., 627 F.3d 730, 738–40 (9th Cir. 2010).

[110] *Id.* at 740.

[111] 42 U.S.C. § 7410(a)(5)(B).

[112] American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong., § 221(c) (2009), http://www.gpo.gov/fdsys/pkg/BILLS-111hr2454pcs/pdf/BILLS-111hr2454pcs.pdf.

ing the development of aircraft-related emissions standards.

However, the American Clean Energy and Security Act bill passed by the House did include liquid petroleum fuels, including jet fuel, in the cap-and-trade program. Had it come into effect, the bill would have likely increased costs associated with jet fuel as the emissions cap was lowered over time.[113] Airlines are cognizant that potential climate change regulation could impact the aviation sector, and in particular fuel prices. In accordance with recent Securities and Exchange Commission guidance regarding disclosure related to climate change,[114] United Airlines, American Airlines, and Delta Air Lines all acknowledged that U.S. or international climate regulation could impact their businesses in their annual investor disclosures.[115]

b. EPA Regulation of GHGs from Mobile Sources.—In the absence of federal legislation establishing a regulatory program for climate change–related emissions, EPA has been moving forward with regulations for GHGs under the CAA. In 2009, EPA determined that emissions of GHGs from motor vehicles endanger the health and welfare of current and future generations, enabling and requiring EPA to regulate GHG emissions under the CAA.[116] At the same time, there have been efforts in Congress to remove or delay EPA's ability to promulgate and enforce standards relating to GHGs under the CAA. It is unclear at this time whether any such measures will have sufficient support to become law.

Aircraft and Aircraft Engine Emissions Standards

Section 231 of the CAA governs pollution standards for aircraft and aircraft engines.[117] EPA's existing standards are found in 40 C.F.R. Part 87. As discussed in Section III.A.1.a, a 2011 federal district court case held that EPA must consider whether GHGs endanger public welfare and, if so, whether standards are necessary. EPA has not yet done so. If it does promulgate emissions standards, EPA has the discretion to consider a variety of factors, including international standards, safety concerns, and compliance costs.[118] FAA enforces EPA's standards through regulation.[119]

EPA's authority to establish standards for GHG emissions from aircraft under the CAA does not extend to the regulation of jet fuel. Rather, FAA has exclusive authority to prescribe "standards for the composition or chemical or physical properties of an aircraft fuel or fuel additive to control or eliminate aircraft emissions" for pollutants EPA has found endanger the public health and welfare.[120]

EPA's 2008 Advanced Notice of Proposed Rulemaking on Regulating Greenhouse Gas Emissions discussed two potential approaches for regulating aircraft GHG emissions under the CAA: engine emission standards or a fleet-average standard.[121] Under an engine emission standard, each aircraft could be required to emit less than a particular level of GHGs. EPA currently establishes aircraft emissions standards for other pollutants and also requires measurement and reporting of CO_2 emissions during engine exhaust testing for certification.[122] EPA indicated that under an engine emission standard approach it could seek a near-term (i.e., 5 year) standard based on best currently available technology and consider more significant reductions requirements over the long term.[123]

Under a fleet-average standard, EPA could hold airlines responsible for meeting average emissions standards for their entire fleet, rather than for each individual engine.[124] EPA also discussed the possibility of measuring average fleet compliance through alternative metrics, such as fuel consumption or methodologies that would take into account operational controls that reduce GHG emissions.[125] Airlines would likely be able to use flexible compliance mechanisms to generate, bank, and trade compliance credits with other airlines.[126]

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[113] *See* John E. Putnam, *The American Clean Energy and Security Act of 2009: How Would the Bill Passed by the House Affect the Aviation Industry?* (July 14, 2009), *available at* http://www.kaplankirsch.com/files/Waxman-Markey_Aviation_Paper.pdf.

[114] Commission Guidance Regarding Disclosure Related to Climate Change, 75 Fed. Reg. 6290 (Feb. 8, 2010).

[115] United Continental Holdings, Inc., Annual Report (Form 10-K) 10-11 (Feb. 26, 2010); AMR Corporation, Annual Report (Form 10-K) 9 (Feb. 17, 2010); Delta Air Lines, Inc., Annual Report (Form 10-K) 8, 19 (Feb. 24, 2010).

[116] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).

[117] 42 U.S.C. § 7571.

[118] Nat'l Ass'n of Clean Air Agencies v. EPA, 489 F.3d 1221, 1230 (D.C. Cir. 2007) (upholding a final rule regulating nitrogen oxide emissions from aircraft where the final rule did not interpret "the Act as requiring the agency to give subordinate status to such factors as cost, safety, and noise").

[119] 42 U.S.C. § 7572(a).

[120] 49 U.S.C. § 44714.

[121] Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,472 (July 30, 2008). Test methods for greenhouse gases other than CO_2 would require development. *Id.* at 44,469.

[122] *Id.* at 44,472.

[123] *Id.*

[124] *Id.* Note that EPA's regulation of emissions from aircraft currently does not apply to general aviation engines. *Id.* at 44,473.

[125] *Id.* at 44,472–73.

[126] *Id.* at 44,472.

Motor Vehicle GHG Emission Standards

In March 2010, EPA and the National Highway Traffic Safety Administration (NHTSA), which is responsible for vehicle fuel economy standards, finalized a joint automotive GHG emissions rule for passenger cars and light trucks with model years 2012 through 2016. The rule requires corporate average fuel economy of 35.5 mi/gal and a combined average emissions level of 250 grams of CO_2 per mile by 2016.[127] This was the first federal regulation of GHG emissions under the CAA, and it triggered the potential for EPA to regulate emissions from utilities and other stationary sources. For model years 2017 through 2025, EPA and NHTSA will conduct an analysis of even stricter requirements that could be equivalent to a range from 47 mi/gal to 62 mi/gal.[128]

4. EPA Regulation of GHGs from Stationary Sources

EPA has also begun to regulate GHG emissions for new or modified large stationary sources such as power plants, industrial facilities, and refineries. Some very large airports' heating/cooling, cogeneration, or other stationary facilities could be subject to these requirements now or with future developments.

The first step in EPA's regulatory process was to require certain large emitters of GHGs to report their emissions. Airports with large combustion-based heating, cooling, or cogeneration facilities at airports were more likely to be subject to this requirement. Five airports reported their emissions for 2010.[129] Facilities that emit 25,000 metric tons or more of CO_2 equivalent (MT CO_2e) per year will be required to report GHG emissions data to EPA annually.[130]

Table 1. Airport Stationary Sources Reporting GHG Emissions to EPA in 2011

Airport	2010 Emissions MT CO_2e (metric tons of CO_2 equivalent)
Denver International Airport	28,926
Cottonbelt Compressor Station at Dallas/Fort Worth Airport	31,365
Los Angeles International Airport	47,439
Massport Logan Airport (BOS)	29,120
O'Hare International Airport	52,219

As a next step, EPA adopted a regulation, known as the "Tailoring Rule," by which emitters of GHGs will have to secure permits for certain new or modified major stationary sources.[131] EPA's rule went into effect in January 2011.[132]

Applicability thresholds used to determine when emissions of traditional pollutants are subject to CAA regulation are exceptionally low for GHGs (250 tons per year or lower) and would sweep in a very large number of sources, including stationary sources of combustion at airports if applied to GHGs. EPA recognized the difficulties associated with this situation and has set much higher thresholds for determining when a "major source" of GHG emissions is subject to regulation under two CAA stationary source permitting programs—the Prevention of Significant Deterioration and Title V Operating Permit programs. The Tailoring Rule phases in applicability of those programs to GHG emissions by setting GHG thresholds that are higher than the statutory thresholds.[133] Prevention of Significant Deterioration requirements will apply to new sources that emit at least 100,000 tons of GHGs per year, or to existing sources whose GHG emissions will increase by 75,000 tons per year.[134] Sources already subject to Title V's permitting provisions will also be required to report GHG emissions.[135]

Because aircraft, nonroad GSE, and motor vehicles are mobile and not stationary sources, the application of the Tailoring Rule to airports would likely focus on very large stationary sources—such as boilers and cogeneration and heating plants—that meet emissions thresholds.[136] However, as noted above, airport-related, sta-

[127] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25,324 (May 7, 2010).

[128] 2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards; Notice of Intent, 75 Fed. Reg. 62,739 (Oct. 13. 2010).

[129] GHG Data, 2010 Greenhouse Gas Emissions from Large Facilities, http://tinyurl.com/74vwtve (last visited June 12, 2012).

[130] Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009); 40 C.F.R. pt. 98.

[131] 40 C.F.R. pts. 52, 70; Final Title V Permitting Programs Under the Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 250 (Dec. 30, 2010).

[132] *Id.*

[133] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31514 (June 3, 2010).

[134] *Id.* at 31518.

[135] *Id.* at 31523.

[136] *See also* discussion of indirect sources at § III.A.2, herein.

tionary-source, GHG emissions reported to EPA are well below the Tailoring Rule thresholds.

5. EPA Regulation of Refrigerants and Fire-Control Substances

Many refrigerants used in industrial and commercial settings, including at airports, are potent GHGs that deplete stratospheric ozone (also known as the ozone layer). Title VI of the CAA regulates certain refrigerants, fire control substances, and other chemicals that can deplete stratospheric ozone. Section 608 of the CAA and its implementing regulations restrict the use, venting, release, and disposal of refrigerants from stationary sources.[137] Under these regulations, EPA is obligated to "reduce the use and emission of such substances to the lowest achievable level."[138] Refrigerants used in motor vehicle air conditioning are also subject to restrictions under Section 609 of the CAA.[139]

Airports already face a number of mandatory duties associated with the use and disposal of certain refrigerants that are also GHGs. Steps beyond these mandatory duties may be able to further reduce GHG emissions and may provide some opportunities to generate surplus credits.

B. Federal (Non-CAA) Preemption of Aviation Regulation

This subsection discusses federal statutes that preempt state or local control over flight operations; airport activities that would affect air carrier prices, routes, or services; and noise and access restrictions at airports. Because aircraft are generally the largest source of GHG emissions at U.S. airports, these limitations on airport control of aircraft operations and access have the potential to greatly affect an airport's ability to reduce its carbon footprint. This is particularly true given that FAA has taken a sweeping view of the preemptive scope of the federal aviation provisions, maintaining that they preclude a wide range of safety and environmental measures taken by airports that could affect aircraft or flight operations.[140] Airport GHG measures that are intended to affect aircraft or aircraft operations—or have the effect of doing so—could trigger these federal aviation preemption provisions. For example, an airport decision to cap the number of aircraft flights to restrict GHG growth would be preempted.

FAA views the proprietor exception (discussed below) to preemption in this field as "very limited."[141] In a recent decision, FAA acknowledged the existence of a limited proprietor's right in the areas of noise and congestion regulation, but argued that this right does not extend to aviation safety and operations cases.[142] FAA's argument has yet to be fully tested in federal court or in the context of GHG reductions.[143] FAA has supplemented its view of the preemptive force of the aviation statutes by taking a similarly wide view of the force of the grant assurances, allowing only reasonable restrictions on aircraft operations.

1. Preemption of Control Over Flight Operations

Neither airport proprietors nor other local entities may regulate the operation of aircraft in flight for any purpose, including reducing GHG emissions.[144] The federal interest in aircraft operations extends to their operations on the airport, at least on active runways.[145] Aircraft operation on parts of the airport other than the runways may be seen as affecting aviation safety and efficiency and also may be subject to federal preemption.

2. Preemption of Authority Over Prices, Routes, or Services of an Air Carrier

As part of its deregulation of the airline industry in the late 1970s, Congress granted the Federal Government exclusive authority over prices, routes, and services of air carriers, so that "States would not undo federal deregulation with regulation of their own."[146] In 1994, Congress recodified the Airline Deregulation Act's preemption provision in the FAAA Act, which provided that states and local governments "may not enact or enforce a law, regulation, or other provision having the force and effect of law related to a price, route, or service of an air carrier that may provide air transportation…."[147]

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[137] 42 U.S.C. § 7671g.

[138] *Id.* § 7671g(a)(3)(A).

[139] *Id.* § 7671h.

[140] *See* FAA, Final Decision and Order, *In the Matter of the City of Santa Monica*, FAA Docket No. 16-02-08, at 3–4 (July 8, 2009), *modified by* Order Granting Motion for Clarification of Final Agency Decision (Sept. 3, 2009).

[141] *Id.* at 32.

[142] *Id.* at 33 (July 8, 2009).

[143] FAA's decision was appealed to the D.C. Circuit and decided in City of Santa Monica v. Fed. Aviation Admin. The D.C. Circuit declined to decide the case on preemption grounds, and considered only grant assurances in deciding the case. City of Santa Monica v. FAA, 631 F.3d 550, 553 (D.C. Cir. 2011).

[144] *See* 49 U.S.C. § 40103(a)(1) ("The United States Government has exclusive sovereignty of airspace of the United States"); 49 U.S.C. § 40103(b) (delegating responsibility to the FAA to "develop plans and policy for the use of the navigable airspace" and to "prescribe air traffic regulations on the flight of aircraft"); Nat'l Helicopter Corp. of Am. v. City of New York, 137 F.3d 81, 92 (2d Cir. 1998) ("the law controlling flight paths through navigable airspace is completely preempted").

[145] Nw. Airlines, Inc. v. Minnesota, 322 U.S. 292, 303, 64 S. Ct. 950, 956, 88 L. Ed. 1283, 1290 (1944) (Jackson, J., concurring) ("The moment a ship taxis onto a runway it is caught up in an elaborate and detailed system of controls.").

[146] Morales v. Trans World Airlines, Inc., 504 U.S. 374, 378–79, 112 S. Ct. 2031, 2034, 119 L. Ed. 2d 157, 164 (1992).

[147] 49 U.S.C. § 41713(b)(1) (this provision as adopted in 1994 amends and incorporates a similar provision found at § 1305(a)(1) of the Airline Deregulation Act (ADA)). Federal Aviation Administration Authorization Act of 1994, Pub. L. No. 103-305, § 601, 108 Stat. 1605 (1994).

The U.S. Supreme Court has defined "relating to" broadly, to include state actions "having a connection with, or reference to, airline 'rates, routes, or services.'"[148] Thus, the FAAA Act preempts states from undertaking a broader set of actions than only those that directly affect airlines prices, routes, or services.[149] Preemption under this provision is not limited to state laws addressed to the airline industry.[150] While the Court has acknowledged that there could be some state actions affecting airline fares in "too tenuous, remote, or peripheral a manner" to be preempted, it has declined to "draw the line" that might resolve borderline questions.[151]

The FAAA Act expressly provides that its preemption provisions do not apply to government authorities that are airport proprietors acting within the scope of their proprietary powers.[152] The proprietor exception is rooted in airports' liability for airports' adverse impacts in surrounding communities. Proprietary acts that affect air carrier prices, routes, or services are not subject to analysis under the Commerce Clause because of their explicit congressional approval.[153]

Several courts have held that airports' proprietary rights extend to regulation of environmental concerns, but the limits of this authority have not been clearly established.[154] Two areas in which proprietary regulatory rights have long been recognized are airport fueling activities and perimeter rules enacted for the sake of congestion management. As the Fifth Circuit recently recognized, "Courts applying this standard have upheld route restrictions as within propriety powers when they are targeted at advancing a specific local interest.... In each of these cases [upholding route restrictions], the proposed restriction was targeted at alleviating an existing problem at the airport or in the surrounding neighborhood."[155]

Decisions about fueling activities on airport facilities are frequently treated as proprietary business decisions.[156] For example, FAA has frequently upheld proprietors' justifications regarding fuel tank locations, many of which reflect environmental interests similar to those implicated by potential GHG-reduction measures. A recent ACRP digest detailed justifications FAA has found sufficient to support fuel tank siting decisions, including:

> a desire to restrict fuel tanks to past locations; concerns that past tenants left underground tanks that the airport had to remove; a desire to use locations that accommodate future reversionary interests; taking actions based on the proprietor's custodial view of the airport rather than just a private interest in tank locations; a history of past contamination resulting in expensive cleanup; concerns that bankruptcy might leave the proprietor the only solvent party; concerns that any contamination could divert airport staff time; desires to centralize fuel capacity and minimize the risk of contamination; desires to prevent a proliferation of private tanks from reducing available hangar space; concerns that tank locations would interfere with airport development plans; and concerns that proposed tanks could be hit by aircraft.[157]

In a 1988 case applying proprietary analysis to the preemption context, *Western Air Lines, Inc. v. Port Authority*, a federal district court rejected the argument that airports are only permitted to impose restrictions relating to noise and upheld the Port Authority's perimeter rule as proper to manage congestion in a multi-airport system.[158] The court observed that the Airline Deregulation Act

> does not expressly limit proprietary powers to the regulation of noise, although presumably Congress would have so limited the section if that is what it had in mind. As Judge Weinfeld said in *Midway Airlines v. County of Westchester*, 584 F. Supp. 436 (S.D.N.Y. 1984) "[t]he legislative history is unmistakably clear that Congress did not intend that the preemptive force of 49 U.S.C. § 1305(a)(1) would interfere with the 'long recognized powers of the airport operators to deal with noise and other *environmental problems* at the local level.'" *Id.* at 440 n.18 (quoting 123 Cong. Rec. 37419 (1978) (remarks of Sen. Kennedy)).[159]

Similarly, the Second Circuit Court of Appeals ruled in *National Helicopter v. City of New York*[160] that regulations addressing environmental and noise concerns are within the proprietor exception to preemption when they are "reasonable, nonarbitrary, and nondiscriminatory."[161]

It is not clear that the proprietor exception would exempt GHG-based actions from federal preemption, because there is no clear liability on the part of airports at this time for GHG emissions. Climate change is a

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[148] *Morales,* 504 U.S. at 384.

[149] *Id.* at 385–86.

[150] *Id.* at 386 (offering state benefit plans as an example of where regulation might affect airline prices, routes, or services and thus be preempted).

[151] *Morales*, 504 U.S. at 390.

[152] 49 U.S.C. § 41713(b)(3).

[153] Nat'l Helicopter Corp. of Am. v City of New York, 137 F.3d 81, 92 (2d Cir. 1998).

[154] Reimer & Putnam, *supra* note 26, at 88–93.

[155] Am. Airlines, Inc. v. Dep't of Transp., 202 F.3d 788, 806 (5th Cir. 2000).

[156] JODI HOWICK, ANALYSIS OF FEDERAL LAWS, REGULATIONS, AND CASE LAW REGARDING AIRPORT PROPRIETARY RIGHTS 30 (Airport Cooperative Research Program, Transportation Research Board, LRD Report No. 10, Sept. 2010), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_lrd_010.pdf.

[157] *Id.* at 31.

[158] W. Air Lines, Inc. v. Port Auth. of N.Y. & N.J., 658 F. Supp. 952, 957–58 (S.D.N.Y. 1986).

[159] *Id.* at 957 (S.D.N.Y. 1986). Note: 49 U.S.C. § 1305(a)(1) has been recodified at 49 U.S.C. § 41713(b)(1) (1994), which contains nearly identical language.

[160] 137 F.3d 81 (2d. Cir. 1998).

[161] *Id.* at 88–89 (upholding curfews and reduction of operations to restrict helicopter noise, but rejecting a ban on aircraft above a certain size as discriminatory and rejecting restrictions on air routes).

global problem, and it is not clear whether the nexus between local efforts to reduce GHGs and the local or global effects of climate change is strong enough to support regulations affecting airline routes, rates, and services. Courts have not defined the extent to which local contributions to a global problem (even with local effects) would support efforts that affect airline routes, rates, or services. Limitations on other harmful air emissions (like those that contribute to local smog) may be more clearly permissible, because airports face mandatory regulatory and other provisions that affect airport liability and the ability to expand in the future.

Regardless, actions that are proprietary and thus that are exempt from preemption under federal transportation and aviation statutes may still be subject to other FAA requirements, such as grant assurances and the Airport Noise and Capacity Act of 1990 (ANCA).[162] As discussed below, the FAA has taken a very narrow view of proprietors' power to affect airline or aircraft operations.

3. Preemption of Noise and Access Regulation

Federal law relating to preemption of local efforts to regulate noise is also relevant to efforts to regulate GHGs, because the preemptive force of the ANCA and other provisions address some airport access restrictions undertaken for reasons other than noise. Congress has asserted the Federal Government's role in the regulation of aircraft noise since the 1960s.[163] Local government operators of airports had long taken some responsibility for noise impacts through their police powers, and also as proprietors liable for noise impacts in surrounding communities.[164]

The scope of an airport's proprietary power to restrict aircraft operations was addressed through litigation in subsequent years. In *City of Burbank v. Lockheed Air Terminal, Inc.*,[165] the U.S. Supreme Court ruled in 1973 that a local government that was not the airport proprietor was expressly preempted from restricting aircraft operations for the purposes of controlling noise. The Court left open the question of whether airport proprietors may restrict aircraft operations for other purposes. Subsequent cases have held that airport proprietors do retain some authority to enact noise or access regulations for their airports, subject to varying limitations.[166] The most commonly cited requirement is that the rules be reasonable, nonarbitrary, and nondiscriminatory.[167] Examples of types of restrictions that were upheld as appropriate exercises of airport proprietary powers include night curfews on takeoffs and landings;[168] prohibitions of certain low altitude approaches on weekends;[169] prohibitions on helicopter flight training;[170] maximum single event noise exposure levels;[171] temporary bans on particular types of aircraft;[172] and reductions in the number of flights permitted at an airport.[173]

However, in 1990, Congress limited the scope of the proprietors' authority to implement similar regulations when it adopted ANCA.[174] ANCA and its implementing regulations impose requirements on airports that must be satisfied prior to implementation of certain types of noise or access rules. Some requirements are quite onerous, such as the need for airports to obtain FAA approval prior to enactment of noise restrictions affecting Stage 3 aircraft. The FAA's process for approving operational procedures under Part 161 of the Federal Aviation Regulations is difficult and complex.[175]

Determining whether a proposed action is subject to ANCA and Part 161 is itself a difficult question due to the breadth of the applicable language. ANCA defines "noise or access restrictions" very broadly, to include "any other limit on Stage 2 or Stage 3 aircraft that has the *effect* of controlling noise."[176] Additionally, FAA considers airport's intentions in determining whether a violation has occurred, which necessarily introduces subjectivity into the process.

The statute refers to noise *or access* restrictions, so it is possible that ANCA could apply to some restrictions designed to reduce GHG emissions such as limitations on high-GHG-emitting aircraft, GHG caps, or emissions budgets that could also have the effect of reducing noise.

Under ANCA, an airport may only impose airport noise or access restrictions for Stage 3 aircraft if they are agreed to by the proprietor and all aircraft operators, or if they are approved by the Department of

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[162] *See* 49 U.S.C. §§ 14501(c) or 49 U.S.C. § 41713(b)(3).

[163] Aircraft Noise Abatement Act of 1968, Pub. L. No. 90-411, 82 Stat. 395 (codified at 49 U.S.C. § 1431(b)(1) (1976); Noise Control Act of 1972, Pub. L. No. 92-574 (codified at 42 U.S.C. §§ 4901–4918 and 49 U.S.C. § 44715 1972).

[164] City of Burbank v. Lockheed Air Terminal, Inc., 411 U.S. 624, 644–645, 93 S. Ct. 1854, 1865, 36 L. Ed. 2d 547, 560 (1973) (Rehnquist, J., dissenting).

[165] *Id.* at 624.

[166] *See, e.g.,* British Airways Bd. v. Port Auth. of N.Y. & N.J., 558 F.2d 75 (2d. Cir. 1977); Santa Monica Airport Ass'n v. City of Santa Monica, 659 F.2d 100 (9th Cir. 1981); Pirolo v. City of Clearwater, 711 F.2d 1006 (11th Cir. 1983).

[167] British Airways Bd. v. Port Auth. of N.Y. & N.J., 558 F.2d 75, 84 (2d. Cir. 1977).

[168] *Santa Monica Airport Ass'n*, 659 F.2d at 102.

[169] *Id.*

[170] *Id.*

[171] *Id.*

[172] British Airways Bd. v. Port Auth. of N.Y. & N.J., 558 F.2d 75 (2d. Cir. 1977).

[173] Alaska Airlines, Inc. v. City of Long Beach, 951 F.2d 977 (9th Cir. 1991) (ordinance not preempted by federal law, though invalidated on other grounds).

[174] 49 U.S.C. §§ 47521–47533.

[175] LINDA LUTHER, ENVIRONMENTAL IMPACTS OF AIRPORT OPERATIONS, MAINTENANCE, AND EXPANSION 4, tbl. 1, CONG. RESEARCH SERV., RL 33949 (Apr. 5, 2007), *available at* http://www.fas.org/sgp/crs/misc/RL33949.pdf.

[176] 14 C.F.R. § 161.5 (emphasis added).

Transportation.[177] The Secretary of Transportation may approve restrictions only after finding that:

> (A) the restriction is reasonable, nonarbitrary, and nondiscriminatory;
>
> (B) the restriction does not create an unreasonable burden on interstate or foreign commerce;
>
> (C) the restriction is not inconsistent with maintaining the safe and efficient use of the navigable airspace;
>
> (D) the restriction does not conflict with a law or regulation of the United States;
>
> (E) an adequate opportunity has been provided for public comment on the restriction; and
>
> (F) the restriction does not create an unreasonable burden on the national aviation system.[178]

Airports demonstrate compliance with these requirements through an extensive cost-benefit study and public involvement process.[179]

An airport may impose airport noise or access restrictions for Stage 2 aircraft without FAA approval, but only after a study and public comment period. The study must address the costs and benefits of the proposed restrictions, as well as alternative measures considered.[180] Although FAA is not statutorily authorized under ANCA to disprove of regulations, FAA asserts that it retains the authority to challenge airport noise and access restrictions it views as "discriminatory, unreasonable, or [as] impos[ing] an undue burden on interstate commerce."[181]

ANCA may apply to some restrictions aimed at reducing GHG emissions, such as limiting access of older aircraft that emit a disproportionate amount of GHG emissions. If ANCA does apply, airports would have to follow rigorous procedural and substantive requirements before imposing restrictions. In particular, airports would need to demonstrate that the limitations are "reasonable, nonarbitrary, and nondiscriminatory" and not unduly burdensome; undertake a cost-benefit analysis of the proposed restrictions; and offer an opportunity for public comment.

C. Federal Legal Restrictions on Rates, Charges, and Use of Revenue

Federal restrictions on the use of airport revenue and the ability to levy charges may also be important limitations on the ability of airports to engage in some types of GHG-reduction efforts, especially those that would physically take place off-site or levy fees on passengers.

1. Anti-Head Tax Act

Under the Federal Anti-Head Tax Act, airports generally may not levy or collect taxes, fees, head charges, or other charges on air passengers, the transportation of air passengers, the sale of air transportation, or gross receipts from air transportation.[182] This law likely bars U.S. airports from imposing mandatory climate-related fees on passengers, which have been proposed or implemented in other countries.

2. Grant Assurance 25—Revenue Diversion

Federal revenue diversion provisions are important to airports' consideration of GHG-reduction or offset measures because any GHG-reduction efforts involving the use of airport revenue will need to be tied to a legitimate aeronautical purpose. FAA only offers grants to airports that agree, in writing through Grant Assurance 25, to limits on the use of airport revenues to the capital and operating costs of the airport.[183] FAA's *Airport Compliance Manual* defines airport revenue as "the fees, charges, rents or other payments received by or accruing to the sponsor from air carriers, tenants, concessionaires, lessees, purchasers of airport properties, airport permit holders making use of the airport property and services, etc."[184] Airport revenues are construed broadly to include virtually all of the funds generated by an airport sponsor from any source.[185] There are severe penalties for diverting airport revenue.[186] Assurance 25 provides that "all revenues generated by the airport…will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities…which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes…."[187]

Thus, a critical threshold question for any airport-related GHG project at a grant-obligated airport is whether it is a reasonable capital or operating cost of the airport, i.e., directly and substantially related to the air transportation of passengers or freight.

In a statement of policy concerning the use of airport revenue, *Policies and Procedures Concerning the Use of Airport Revenue* (Airport Revenue Policies), FAA has offered a list of permitted and forbidden uses of airport revenue.[188] This list does not explicitly discuss expendi-

[177] 49 U.S.C. § 47524(c).

[178] 49 U.S.C. § 47524(c)(2).

[179] PETER J. KIRSCH, AIRPORT NOISE: A GUIDE TO THE FAA REGULATIONS UNDER THE AIRPORT NOISE AND CAPACITY ACT 15–17 (4th ed. 2001).

[180] 49 U.S.C. § 47524(b).

[181] Notice and Approval of Airport Noise and Access Restrictions, 56 Fed. Reg. 48,661, 48,662 (Sept. 25, 1991) (FAA reply to comments on local Stage 2 restrictions under the rules).

[182] 49 U.S.C. § 40116(b).

[183] 49 U.S.C. §§ 47107(b), 47133.

[184] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 15.6 (Sept. 30, 2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[185] *See* FAA, Policy and Procedures Concerning the Use of Airport Revenue, 64 Fed. Reg. 7696 (Feb. 16, 1999).

[186] *E.g.*, 49 U.S.C. § 47107(n).

[187] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 25–Airport Revenues), *available at* http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[188] FAA, Policy and Procedures Concerning the Use of Airport Revenue, 64 Fed. Reg. 7696 (Feb. 16, 1999).

tures aimed at reducing GHG emissions or addressing environmental concerns. However, the policies regarding rates and charges that may be assessed to aeronautical users represent a more restrictive set of tests than for the use of airport revenue, and many environmental costs may be included in the aeronautical rate base.[189] These are discussed in the subsection below.

A straightforward case of allowable expenditures would be a GHG-mitigation measure that a sponsor reasonably believes would reduce the costs of providing aeronautical services in the short or long term. For example, if an airport were to implement energy-efficiency projects that would reduce the costs of energy over their life cycle, there are no plausible revenue diversion concerns. Similarly, investment in alternative sources of energy that may be more expensive in the short term could be justified as prudent expenses if they would be less expensive in the long run than traditional fossil-fuel-derived utility power.

Beyond these simple situations, the Airport Revenue Policies have explicitly approved using revenue for some costs associated with connecting an airport to mass transit lines.[190] In particular, airports are authorized to provide airport property for less than fair market value for public transit terminals, right-of-way, and related facilities.[191] Section IV.G.1 discusses the application of this guidance.

In the absence of additional guidance regarding environmental expenditures, there is some revenue-diversion risk associated with environmental mitigation efforts that have a weaker nexus with "the actual air transportation of passengers or property." This is particularly true for off-airport GHG-mitigation efforts, such as purchasing offsets or financing offsite emissions-reducing activities (e.g., spending airport funds to retrofit school buses to offset on-airport GHG emissions), that are not the subject of mandatory requirements or necessary elements of airport project approvals. Some government entities that operate airports can and have used nonairport revenues to purchase offsets for airport activities. This is permissible, but it is unlikely to occur frequently due to fiscal limitations of most airport operators.

3. Airport Rates and Charges for Aeronautical Users

Similarly, the federal aviation rules that govern the ability to levy fees on aeronautical users also may limit some airport spending for GHG reductions or offsets that would be charged back to aeronautical users. Federal law regarding rates and charges requires that rates and charges charged to aeronautical users be based on the cost of service and also be reasonable and nondiscriminatory.[192] The FAA defines "aeronautical use" as "all activities that involve or are directly related to the operation of aircraft, including activities that make the operation of aircraft possible and safe. Services located on the airport that are directly and substantially related to the movement of passengers, baggage, mail, and cargo are considered aeronautical uses."[193]

Under FAA's *Policy Regarding Airport Rates and Charges* (Rates and Charges Policy), airports may include "reasonable environmental costs" in their rate base and recover those costs through fees charged for providing airfield aeronautical services and facilities.[194] Resulting revenues are subject to the requirements on the use of airport revenue discussed above.[195] "Reasonable environmental costs" permitted in the Rates and Charges Policy may not encompass the full range of possible measures to address GHG emissions. The examples provided by the Rates and Charges Policy are costs of addressing environmental contamination, costs of mitigating the environmental impact of an airport development project, the cost of noise abatement and mitigation measures, and the costs of insuring against future environmental liability for contamination.[196] These are measures tied to specific airport regulatory obligations, development, and liability. While the Rates and Charges Policy provides a nonexclusive list of examples, it is meant to be instructive of the range of permissible activities that can be charged to aeronautical users.[197]

The Rates and Charges Policy authorizes the inclusion in rates and charges of

> the cost of mitigating the environmental impact of an airport development project (if the development project is one for which costs may be included in the rate base), at least to the extent that these costs are incurred in order to secure necessary approvals for such projects, including but not limited to approvals under the National Environmental Policy Act[198] and similar state statutes.[199]

This authority could potentially be used to support efforts to mitigate GHG emissions associated with development projects.

Nevertheless, the wording of FAA's policy is not comprehensive and does not specifically address GHG-

[189] FAA, Policy Regarding Airport Rates and Charges, 61 Fed. Reg. 31994, 32018 (June 21, 1996) (note that other portions of this policy were vacated in Air Transport Ass'n of America v. Dep't of Transp., 119 F.3d 38 (D.C. Cir. 1997).

[190] *Id.* at 7719.

[191] *Id.* at 7721.

[192] FAA, Policy Regarding Airport Rates and Charges, 61 Fed. Reg. 31994, 32018 (June 21, 1996) (note that other portions of this policy were vacated in Air Transport Ass'n of America v. Dept. of Transp., 119 F.3d 38 (D.C. Cir. 1997).

[193] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 18.3(a) (2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[194] *Id.* § 18.10.

[195] *Id.*

[196] FAA, Policy Regarding Airport Rates and Charges, 61 Fed. Reg. at 32019–20.

[197] *Id.*

[198] The National Environmental Policy Act of 1969, as amended, Pub. L. No. 91-190, 42 U.S.C. § 4321–4347.

[199] *Id.*

related expenditures. Thus, airport operators should carefully consider the Rates and Charges Policy in the context of such projects. Inquiries into whether GHG-mitigation efforts can be included in aeronautical rate bases will necessarily be fact-specific and require airports to carefully characterize and justify individual projects. For instance, certain increased capital costs incurred in the interest of reducing GHG emissions (e.g., through energy-efficiency projects) from an airport development project might be analogized to the costs associated with the architectural elements of capital projects, which airports are generally permitted to pass on. Similarly, on-airport renewable energy projects in which the energy is used on the airport probably could be covered as operational and capital costs of an airport, so long as the costs were not wholly disproportionate to the costs of conventional power. Off-airport projects that do not provide direct benefits to the airport (e.g., offset or sequestration projects) are likely to entail greater risk.

As a separate rates and charges issue, the Department of Transportation and FAA have recognized the legitimacy of congestion pricing and other narrowly structured peak-period pricing mechanisms in limited circumstances. Recent FAA guidance also allows proprietors at certain congested airports to include the costs of secondary airports in fees that they charge at a congested airport during peak times.[200] GHG-related fees or charges could conceivably be used to reduce congestion-related emissions or otherwise disincentivize GHG emissions. Airports also may increase landing fees during peak periods of congestion if overall fees are limited to the recovery of historic costs.[201] To date, these mechanisms have not been imposed or evaluated for the express purpose of reducing GHG emissions. Such mechanisms may also trigger the provisions of ANCA, discussed above at Section III.B.3.

4. Self-Sustaining Airport Requirement

Federal law and Grant Assurance 24 also require that airport owners or operators maintain a schedule of charges that will make the airport as self-sustaining as possible, given the airport's circumstances.[202] Pursuant to these requirements, FAA requires that rates charged for nonaeronautical uses of an airport must be based on fair market value.[203] Particularly expensive GHG-related mitigation costs could raise concerns regarding airport self-sustainability. Similarly, allowing the use of airport property for renewable energy or sequestration projects undertaken by third parties should be evaluated to ensure compliance with self-sustaining airport requirements, including consideration of whether the airport has received fair market rentals, the power produced by a project, or other similar consideration.

5. Fees and Charges on Off-Airport, Nonaeronautical Businesses Seeking Access to the Airport

Fees or charges (as well as conditions of service) on nonaeronautical uses that access or otherwise use the airport such as taxi services could also be structured to reduce vehicle trips or fund GHG-reduction efforts. Airports may impose access fees and charges on off-airport, nonaeronautical businesses that are seeking access to the airport, such as parking and other concessions or users of collateral land.[204] These fees are not subject to the Anti-Head Tax Act, which "was intended to protect passengers transported by *aircraft*."[205] Examples of

[200] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 18.3(a) (2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[201] FAA, Policy Regarding Airport Rates and Charges, 73 Fed. Reg. 40,430 (July 14, 2008); *see also* FAA, Policy Regarding Airport Rates and Charges, 73 Fed. Reg. 3310 (Jan. 17, 2008); Howick, *supra* note 156.

[202] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 24–Fee and Rental Structure), *available at*http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[203] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 17-4 (2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[204] *See, e.g.*, Alamo Rent-A-Car, Inc. v. Sarasota-Manatee Airport Auth., 906 F.2d 516 (11th Cir. 1990) (airport's resolution requiring off-airport car rental companies to pay 10 percent of their gross receipts derived from airport customers was constitutional); Park Shuttle N Fly, Inc. v. Norfolk Airport Auth., 352 F. Supp. 2d 688 (E.D. Va. 2004) (imposition of a privilege fee on off-airport parking operations was constitutional); Enterprise Leasing Co. of Detroit v. County of Wayne et al., Nos. 98-1278, 98-1398, 1999 U.S. App. LEXIS 22992 (6th Cir. Sept. 14, 1999) (airport's user fee charged to off-airport rental companies was constitutional); Club Car Rentals of Gainesville, Inc. d/b/a Budget Rent-A-Car of Gainesville v. City of Gainesville Regional Airport Auth., Case No. GCA 85-0177-MMP, 1988 U.S. Dist. LEXIS 18654 (N.D. Fla., May 6, 1988) (fee imposed on plaintiff's off-airport car rental business, which was also charged to on-airport rental companies, was constitutional); General Rent-A-Car, Inc. v. Roberts et al., No. 87-8345-CIV, 1988 U.S. Dist. LEXIS 18653 (S.D. Fla. Sept. 15, 1988) (imposition of a gross receipt fee on all off-airport car rental companies picking up deplaning passengers at an airport was constitutional).

[205] City & County of Denver v. Continental Air Lines, Inc., 712 F. Supp. 834, 837 (D. Colo. 1989) (citing Salem Transp. Co. v. Port. Auth., 611 F. Supp. 254 (S.D.N.Y. 1985) (Section 1513(a) of the Anti-Head Tax Act does not apply to ground transportation services used by airline passengers at New York metropolitan airports); Airline Car Rental, Inc. v. Shreveport Airport Auth., 667 F. Supp. 293, 298–99 (W.D. La. 1986) (Section 1513 was not meant to apply to shuttle services provided by non-tenant rental car agency used by airline passengers); Arizona v. Cochise Airlines, 126 Ariz. 432, 626 P.2d 596 (Ariz. Ct. App. 1980) (Arizona transaction privilege tax, to the extent it imposes a tax on the transportation of freight and not persons in air commerce, does not violate the Anti-Head Tax Act).

situations where the Anti-Head Tax does not apply include city parking taxes and fuel dispensing fees.[206]

Additionally, fees on off-airport, nonaeronautical businesses are not subject to the "reasonable and nondiscriminatory" grant assurance (Assurance 22) requirement applicable to aeronautical users, and legal challenges to such fees have generally been unsuccessful.[207] Airports may be able to use this power to achieve GHG-reduction goals, e.g., through incentives for airport access vehicles like taxis, rental cars, buses, and shuttles to operate on alternative fuels. However, such fees may be subject to state regulation and Dormant Commerce Clause principles (e.g., fees must not be excessive and disproportionate to the needs of the imposing authority).[208]

D. Federal Airport Improvement Program, Voluntary Airport Low Emissions Program, and Passenger Facility Charges

The limitations on imposition of charges and revenue use discussed above apply generally to airports receiving federal financial assistance. Two important sources of federally-allowed funding for airport projects are the Airport Improvement Program (AIP) and Passenger Facility Charge (PFC) programs. Some GHG-reducing projects are likely to qualify for AIP and PFC funding, but others may not be eligible because of limitations in these programs.

AIP and PFC eligibility standards and guidelines do not explicitly address the eligibility of projects to reduce GHG emissions, but they do contain a number of indirect limitations on such projects. Eligibility is typically determined by the nature of the project, e.g., the type of airport development.[209] The allowable uses of PFC revenues are broader than the uses of AIP funds, but narrower than the uses of general airport revenue. Voluntary Airport Low Emissions (VALE) funding expressly targets air quality; many projects that qualify for such funding also reduce GHG emissions.

1. Airport Improvement Program Grants

AIP grants are, in general, the most restricted funds available for airports. Airport funds must be used for capital projects that meet the definition of "airport development" in 49 U.S.C. § 47102(3). Types of projects that may be eligible for AIP funding and also provide GHG-reduction benefits include the following:

- Runway, taxiway, hold pad, and other airfield improvements that would reduce GHG emissions by reducing airfield congestion.[210]
- Energy assessments on new buildings or on the expansion of an existing building, funded as incidental elements of the building design.[211]
- Some energy-efficient terminal development projects, including baggage claim delivery areas, automated baggage-handling equipment, public-use corridors to boarding areas, central waiting rooms, restrooms, holding areas, foyers and entryways, and passenger loading bridges.[212]
- On-airport rapid transit systems and multimodal terminal buildings under certain circumstances.[213]

2. Passenger Facility Charge Programs

Airports are authorized by 49 U.S.C. § 40117 to impose PFC charges, which are charges of up to $4.50 on enplaning passengers.[214] PFC charges are an exception to the general ban on airport taxes, fees, or head charges on air passengers and air transportation, but they must be used for specified purposes, such as safety-related projects, noise reduction projects, and projects to increase air carrier competition.[215]

The eligibility of terminal development projects is broader under the PFC program than under the AIP program.[216] "Eligible airport-related project" is defined at Section 40117(a)(3) and explicitly includes conversion of ground support equipment to low-emission technology.[217] Airline ticketing areas, check-in facilities, and gates located at hub airports are PFC-eligible, even though they are not AIP-eligible.[218] In addition, 49 U.S.C. § 40117(a)(3)(F) expanded PFC eligibility of gates and related areas, such that some projects ad-

[206] Burbank-Glendale-Pasadena Airport Auth. v. City of Burbank, 64 Cal. App. 4th 1217, 76 Cal. Rptr. 2d 297 (Cal. Ct. App. 1998) (city parking tax not prohibited by the Anti-Head Tax Act); *In re Menier*, 59 B.R. 588 (Bankr. N.D. Ohio 1986) (fuel dispensing fee not subject to the Anti-Head Tax Act).

[207] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 22–Economic Nondiscrimination), *available at* http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf; *See, e.g.,* Four T's, Inc. v. Little Rock Mun. Airport Comm'n, 108 F.3d 909 (8th Cir. 1997) (refusing to interfere with concession fees charged by airport to rental car companies; Airport and Airway Improvement Act of 1982 was not "intended to benefit nonaeronautical parties such as car rental concessionaires").

[208] *See, e.g.*, Arrow Airways, Inc., et al. v. Dade County, 749 F.2d 1489 (11th Cir. 1985).

[209] *See* 49 U.S.C. §§ 40117 (PFC), 47106 (AIP).

[210] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK ch. 5 (2005), *available at* http://www.faa.gov/airports/resources/publications/orders/media/aip_5100_38c.pdf.

[211] *Id.* § 607.

[212] *Id.* § 601.

[213] *Id*. §§ 612, 622.

[214] 49 U.S.C. § 40117(b)(4).

[215] *See* 49 U.S.C. § 40117(b).

[216] FEDERAL AVIATION ADMINISTRATION, Order 5500.1, PASSENGER FACILITY CHARGE § 4-6 (2001), *available at* http://www.faa.gov/documentLibrary/media/Order/PFC_55001.pdf.

[217] *See* 49 U.S.C. § 40117(a)(3).

[218] 49 U.S.C. § 40117(a)(3)(G).

dressing air carrier or airport operations space, concession space, and aircraft fueling facilities may qualify for PFC funding.[219] Some airport ground access projects are also eligible for PFC funding.[220]

GHG-related improvements in these areas could be funded with PFCs, including preconditioned air at gates and more energy-efficient terminal spaces.

3. Voluntary Airport Low Emissions Program

The FAA's VALE program permits airports to use AIP and PFC funds to finance low-emission vehicles, refueling and recharging stations, gate electrification, and other airport air quality improvements, under certain conditions.[221] The VALE program is currently tied to a requirement to create air quality credits for traditional air pollutants (like ozone or particulate matter) in nonattainment areas.[222] Nonattainment areas are those areas designated by EPA as having air pollution levels that persistently exceed one or more of the CAA's national ambient air quality standards.[223] Many projects that can reduce traditional air pollutants would also reduce GHGs. Airports outside of nonattainment areas are currently unable to qualify for VALE funding.

FAA requires airport sponsors to obtain airport emissions reduction credits (AERCs) based on a statutory concern that airports and airlines must receive an aeronautical benefit for the expenditure by helping to facilitate future projects.[224] The AERCs are established through state or EPA assurances.[225] Through these assurances, project sponsors must demonstrate that

- Reduction measures are independently verifiable.
- They have adopted a complete schedule for implementation and verification.
- Violations of AERC requirements are practically enforceable.
- Liability for violations can be identified.
- All airport emissions-related information is made publicly available.[226]

Airport sponsors may then use the earned emissions credits to satisfy General Conformity and New Source Review requirements under the CAA.[227]

While the VALE program targets criteria air pollutants for which National Ambient Air Quality Standards[228] have been established under the CAA, many VALE projects would also reduce GHGs (e.g., electrification of GSE or gate electrification). VALE may provide a useful mechanism to fund some projects with simultaneous GHG and air pollutant benefits.

E. Federal Legal Restrictions on Exclusive Rights and the Imposition of Conditions and Standards

The Federal Government restricts the manner in which airports can structure competitive conditions or impose requirements on aircraft users and aeronautical businesses at an airport. These requirements may, in some circumstances, affect the extent to which an airport can impose GHG-related conditions on its tenants and users.

1. Exclusive Rights

Airports may not grant an exclusive right to provide aeronautical services.[229] Exclusive rights issues may arise in a handful of GHG contexts. For example, prospective providers of biofuels for aircraft may seek assurances regarding market share or exclusivity that airports cannot legally provide. Similarly, an airport cannot limit FBO (providers of on-airport general aviation services) services based on a single FBO that has electrified GSE.

2. Reasonable Terms and Conditions

Airports may impose only reasonable terms and conditions on aeronautical users of an airport.[230] The classes of users subject to this requirement include air

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[219] FEDERAL AVIATION ADMINISTRATION, Order 5500.1, PASSENGER FACILITY CHARGE § 4-6 (2001), *available at* http://www.faa.gov/documentLibrary/media/Order/PFC_55001.pdf.

[220] *Id.*; *see also* Southeast Queens Concerned Neighbors v. FAA, 229 F.3d 387 (2d. Cir. 2000) (upholding FAA's approval, after remand, of PFC funding for the JFK airport light rail system).

[221] FEDERAL AVIATION ADMINISTRATION, VOLUNTARY AIRPORTS LOW EMISSIONS PROGRAM (VALE), *available at* http://www.faa.gov/airports/environmental/vale/ (last visited June 13, 2012); *see* 49 U.S.C. § 40117(c)(3)(G).

[222] FEDERAL AVIATION ADMINISTRATION, VOLUNTARY AIRPORTS LOW EMISSIONS PROGRAM (VALE), *available at* http://www.faa.gov/airports/environmental/vale (last visited June 13, 2012).

[223] *See* U.S. ENVIRONMENTAL PROTECTION AGENCY, THE GREEN BOOK OF NONATTAINMENT AREAS FOR CRITERIA POLLUTANTS, http://www.epa.gov/airquality/greenbook/index.html (last visited June 13, 2012); *see also* U.S. Environmental Protection Agency, Fine Particle Designations FAQs, http://www.epa.gov/pmdesignations/faq.htm#4. States and tribes submit recommendations to EPA regarding which areas should be designated as nonattainment. After considering this data and working with states and tribes, EPA designates certain areas as nonattainment.

[224] U.S. ENVIRONMENTAL PROTECTION AGENCY, GUIDANCE ON AIRPORT EMISSION REDUCTION CREDITS FOR EARLY MEASURES THROUGH VOLUNTARY AIRPORT LOW EMISSION PROGRAMS 3 (2004), http://www.epa.gov/oar/genconform/documents/aerc_040930.pdf.

[225] 49 U.S.C. § 47139(b).

[226] *Id.* at 12–13.

[227] *Id.* at 1 (2004).

[228] National Ambient Air Quality Standards, *available at* http://www.epa.gov/air/criteria.html.

[229] 49 U.S.C. § 40103(e); FAA, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 23–Exclusive Rights), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[230] 49 U.S.C. § 47107(a)(1).

carriers, general aviation aircraft owners and operators, and FBOs.[231] Airports may seek to impose GHG-related provisions in leases, regulations, and other governing documents (e.g., requirements for energy-efficient systems in buildings or bans on unnecessary idling of GSE). However, aeronautical users may raise questions whether particular terms and conditions are reasonable or are applied in a nondiscriminatory fashion.

Grant Assurance 22 requires that aeronautical access to the airport be available on fair and reasonable terms and without unjust discrimination. FAA has used this provision to challenge limitations on airport access imposed by airport proprietors on the basis of noise and safety.[232] FAA has argued that restrictions against aeronautical operators that are "not necessary" and that are unjustly discriminatory are not reasonable.[233] Accordingly, airports seeking to impose such restrictions should carefully and reasonably justify the need for such regulations.

3. Self-Service

An air carrier must be permitted to service itself or use any FBO allowed by the airport to service any carrier at the airport.[234] It is possible that issues associated with the right to self-service could arise, among other contexts, in the context of biofuels that may be provided at airports to reduce GHG emissions. If, for example, an airport decided to exercise a proprietary exclusive right to provide fuel at an airport, the airport could not prohibit airlines from bringing in their own supply of fuel, subject to self-service limits identified by FAA guidance. Accordingly, airports should ensure that any arrangements with biofuels or other alternative fuel projects or providers are consistent with fuel self-service rights pursuant to statute and the grant assurances.[235] Where airports seek to impose equipment requirements, such as requiring the use of alternative vehicles or lower-emitting vehicles, airport users should be able to procure their own conforming equipment or lease equipment rather than using equipment from a specified provider.

4. Minimum Standards

Airports enact and enforce minimum standards in furtherance of their proprietary responsibility to ensure that commercial businesses provide appropriate and adequate aeronautical services to airport users. Such minimum standards may address prohibited on-airport conduct, environmental management, aircraft operating restrictions, ground movement of aircraft, and fuel storage and handling. Minimum standards are generally organized by the type of aeronautical service and address both full-service FBOs and less-than-full-service providers. They typically do not address nonaeronautical activities.[236]

Minimum standards typically cover air taxi and charter, fuel service, aircraft maintenance and repair, aircraft sales and rental, flight training, commercial aircraft storage, and flying clubs. Minimum standards could conceivably include GHG-related provisions relating to requirements for ground-based aircraft power systems, idling, energy efficiency, and recycling.

Minimum standards must be reasonable, relevant, attainable, and uniformly applied.[237] Including GHG-related provisions in minimum standards may help protect airports from unjust discrimination and other claims that could be made by users of the airport. At the same time, requiring GHG-reduction measures in minimum standards should be carefully drafted and supported to ensure the reasonableness of the proposed measures.

F. Federal Requirements Concerning Airport Design, Construction, Security, and Hazards

Federal law requires that grant recipients and some other airports comply with an array of airport design and hazard requirements, including requirements relating to pavement strength, materials, height, security, wildlife attractants, and other hazards. Some of these provisions may be triggered by GHG-reduction projects.

For example, utility-scale wind turbines in the vicinity of airports can pose height concerns and interfere with airport radar systems, implicating airport duties to mitigate airport hazards.[238] Similarly, certain concentrating solar systems (in contrast to photovoltaic (PV) systems) can cause potentially dangerous levels of glare

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[231] N.Y. Airlines, Inc. v. Dukes County, 623 F. Supp. 1435, 1446–47 (D. Mass. 1985) (citing 49 U.S.C. § 2210, recodified as 49 U.S.C. § 47107).

[232] City of Santa Monica v. FAA, 631 F.3d 550, 554 (D.C. Cir. Jan. 21, 2011).

[233] *Id.*

[234] 49 U.S.C. § 47107(a)(6).

[235] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 8.8 (2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[236] *See id.* § 10.2 (2009) ("There is no requirement to include nonaeronautical activities (such as restaurants or car rental) in minimum standards since those activities are not covered under the grant assurances."), *Id.*; FEDERAL AVIATION ADMINISTRATION, ADVISORY CIRCULAR 150/5190-7, MINIMUM STANDARDS FOR COMMERCIAL AERONAUTICAL ACTIVITIES § 1.2(d) (2007), *available at* http://www.faa.gov/documentLibrary/media/advisory_circular/150-5190-7/150_5190_7.pdf.

[237] *See* FAA, Director's Determination, Roger Leonard Cardinal's Pilot Shop, Inc. v. Chesapeake Airport Auth., FAA Docket No. 16-01-06 (Oct. 22, 2002) (finding terms of minimum standards to be unreasonably burdensome).

[238] Clark County v. FAA, 522 F.3d 437, 442–43 (D.C. Cir. 2008); *Wind Farms: Compatible with Military Readiness?: Hearing on the Impact of Wind Farms on Military Readiness Before the Subcomm. on Readiness and the H. Comm. on Armed Services,* 111th Cong. 3 (2010) (statement of Nancy Kalinowski, Vice President, Air Traffic Organization, FAA) (explaining how wind turbines interfere with radar detection), *available at* http://www.windaction.org/?module=uploads&func=download&fileId=2051.

in the vicinity of airport operations.[239] Placement of natural gas fueling stations in or outside of the secured portion of the airfield will have significant effects on the use of the facility due to federal security requirements.

1. Airport Design Standards

FAA provides guidelines for airport design in Advisory Circular 150/5300-13 that apply to airports that have received federal funds.[240] These design guidelines restrict placement of structures and activities near runways, taxiways, and other locations that could affect airport safety, including:

- A *Building Restriction Line* identifying suitable building area locations on airports.
- *Clearway* areas connecting to and extending beyond runway ends for 500 to 1,000 ft.
- *Object Free Zones* necessary for air navigation or ground maneuvering purposes.
- *Runway Protection Zones* off the runway ends.
- *Runway Safety Areas and Taxiway Safety Areas,* in which no objects can be sited unless required to be there by their function.
- *Taxiway Object Free Areas* adjacent to Taxiways.[241]

Restrictions on objects in particular areas and visibility requirements could affect airport projects to reduce GHG emissions that require physical infrastructure or affect the natural landscape. For example, FAA generally recommends that solar projects not be sited within the Runway Protection Zone and requires that solar projects not be sited within an Obstacle Free Zone, a Runway Safety Area, a Taxiway Object Free Area, or a Taxiway Safety Area.[242]

2. Airport Layout Plans and Land Use Releases

To receive AIP funds, airports must maintain an airport layout plan (ALP) approved by FAA and any changes to airport layout (regardless of funding source) generally must be made in accordance with the ALP.[243] Many projects intended to reduce GHG emissions may require ALP amendments, such as:

- Changes to airfield design to improve efficiency of airfield operations.
- Solar installations that are not co-located on existing structures and co-located installations that substantially change the footprint of the building or structure.[244]
- Mass transit facilities, like rail stations.

In addition, airport sponsors are obligated to protect airports from incompatible land uses under Grant Assurance 21.[245] Project sponsors must ensure that a proposed project will not negatively affect existing aviation and airport activities.[246] Failure to take prudent steps to preserve the aeronautical utility of an airport could result in a loss of future federal funding for sponsors.[247]

Under FAA Orders 5100.38 and 5190.6A, ALPs must include an Exhibit "A" map delineating all airport-owned property, regardless of whether such property was acquired with Federal Government funding.[248] "Any land identified on the Exhibit 'A' map may not be disposed of or used for any different purpose without FAA consent."[249] Use of airport property for some GHG-mitigation purposes, such as renewable energy generation or forestry-based sequestration projects, is likely to require FAA consent. Leases of land for nonaeronautical uses may require FAA review.[250]

In Grant Assurance 31, FAA also requires that airport sponsors secure fair rental value from nonaeronautical leases of airport property.[251] This requirement may be relevant to the lease of property to solar project developers or projects for carbon sequestration. The lack of a feasible alternative use for property may keep rental values low, but airports must be prepared to justify low lease values, if offered.

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[239] FEDERAL AVIATION ADMINISTRATION, TECHNICAL GUIDANCE FOR EVALUATING SELECTED SOLAR TECHNOLOGIES ON AIRPORTS 9 (2010), http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide.pdf. *See also* § IV.K.2 in this digest.

[240] FEDERAL AVIATION ADMINISTRATION, ADVISORY CIRCULAR 150/5300-13 AIRPORT DESIGN (1989), *available at* http://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5300_13.pdf.

[241] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 27–28; *see also* FEDERAL AVIATION ADMINISTRATION, ADVISORY CIRCULAR 150/5370-10E, STANDARDS FOR SPECIFYING CONSTRUCTION OF AIRPORTS (2009), *available at* http://www.faa.gov/documentLibrary/media/advisory_circular/150-5370-10E/150_5370_10e.pdf.

[242] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 28.

[243] 49 U.S.C. § 47107(a)(16).

[244] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 30.

[245] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 21–Compatible Land Use), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[246] *Id.*

[247] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 24.

[248] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 7.19 (2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[249] *Id.*

[250] *See, e.g.*, FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 30; *see also* FEDERAL AVIATION ADMINISTRATION, EASTERN REGION AIRPORTS DIVISION SPONSOR GUIDE § 3–Land Release Requirements (2009), *available at* http://www.faa.gov/airports/eastern/aip/sponsor_guide/media/SGSect3.doc (Last visited June 13, 2012).

[251] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 31–Disposal of Land), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

3. Hazard Identification and Avoidance

Grant assurances, including Assurance 20, also require airports to take appropriate action to address activities or objects that may be airport hazards.[252] Assurance 20 provides that an airport

> will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.[253]

Additionally, the airport certification process governed by 14 C.F.R. Part 139 requires airports to take certain steps to avoid wildlife hazards, including the risk that birds will congregate near runways and strike an aircraft.[254]

Part 77 establishes standards and notification requirements for objects affecting navigable airspace.[255] 14 C.F.R. § 77.13 requires the sponsor of proposed construction or alterations exceeding heights 200 ft above ground level to notify FAA, and 14 C.F.R. § 77.23 provides standards for obstructions to air navigation. Submission of a Part 77 Notice of Proposed Construction Form 7460 may be required for some GHG emissions reduction projects requiring construction (such as wind turbines increasing the height of buildings), even where such projects are co-located on existing structures.[256]

A number of GHG-related projects could create physical, electronic, or wildlife hazards. For example, large wind turbines can interfere with airport radar systems and penetrate height restriction surfaces. Forestry or agricultural carbon sequestration projects could result in trees that exceed height standards or vegetation that creates wildlife attractants. Similarly, an on- or near-airport project to grow oilseeds for use in aviation biofuels could attract birds and other wildlife in the vicinity of aircraft operations.

4. Pavement and Other Maintenance and Operation

Grant assurances, including Assurances 11 and 19, provide specific obligations for airports to maintain pavement and other facilities for their useful lives.

> The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation…. It will suitably operate and maintain the airport and all facilities thereon or connected therewith….[257]

Further, for some pavements, an airport must "assure[] or certif[y] that it has implemented an effective airport pavement maintenance-management program and [] that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with Federal financial assistance at the airport."[258]

To the extent that some proposed sustainable pavement approaches, like warm-mix asphalt, could affect the useful life, safety, or maintainability of pavement, they may raise pavement-related grant assurance issues.

5. Security

Especially since the terrorist attacks of September 11, 2001, airports work within an extensive and evolving system of security. While an extensive discussion of security is beyond the scope of this digest, it is important to consider security implications associated with the siting of certain GHG-related activities. One example is the siting of alternative-fuel fueling infrastructure like a compressed natural gas (CNG) station. The location of a CNG station within the secured areas of the airfield would make the station accessible and useful for GSE and other airside equipment. However, security considerations would practically make the station less useful or unusable by ground access vehicles or other public CNG-fueled vehicles. On the other hand, locating a station outside of secured portions of the airport may make it more useful for ground access fleets but impractical for GSE that may not be street legal. Similarly, the location of renewable energy facilities in or out of the secured areas of the airport will affect the security requirements associated with construction, operations, and maintenance.

G. State Laws and Regulations Governing GHG Targets and Reporting of GHG Emissions

Due to the lack of a comprehensive statutory program for GHGs on the federal level, some states and local entities have begun to explore and implement GHG programs that could affect some elements of airport operations. These programs may expand significantly in upcoming years.

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[252] 49 U.S.C. § 47107(a)(9).

[253] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 20–Hazard Removal and Mitigation), *available at* http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[254] 14 C.F.R. § 139.337.

[255] 14 C.F.R pt. 77.

[256] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 34.

[257] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 19–Operation and Maintenance), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[258] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Grant Assurance 11–Pavement Preventative Maintenance), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

1. GHG Emissions Target Legislation

As of 2010, 21 states had adopted statewide emissions targets and goals for one or more GHGs.[259] Laws containing only reporting requirements are unlikely to affect an airport's ability to implement GHG-reduction initiatives. However, some laws go beyond reporting and require actual GHG emissions reductions.

California offers a prime example. The state's Global Warming Solutions Act of 2006 (A.B. 32)[260] was one of the earliest and most far-reaching examples of state climate change legislation. A.B. 32 requires California to reduce statewide emissions of GHGs to 1990 levels by 2020.[261] The law delegates formulation of detailed regulations to the CARB, and specifies that these regulations are to take effect in 2012.

CARB has chosen to implement a cap-and-trade program as the centerpiece of A.B. 32. As explained in Section III.A.3.a, cap-and-trade is a method by which a government establishes a cap on the total pollution and allocates emissions permits to polluting entities. California's program would apply to emissions produced within the state. The entities must hold permits equivalent to their level of pollution and can purchase permits from other entities to satisfy this requirement.

California's cap-and-trade program has faced legal challenges, but, so far, CARB has been able to proceed in the rulemaking process.[262] In December 2011, CARB adopted final cap-and-trade regulations, which will take effect in January 2013.[263] It is expected that these regulations will face new legal challenges in the courts. Potential plaintiffs are likely to argue that cap-and-trade violates CARB's authorizing statutes and the U.S. Constitution.

While the future of cap-in-trade in California is not entirely certain, it is important for airports to consider the program's potential impacts if implemented. As written, the California cap-and-trade rules do not apply to airports themselves, but they do apply to cogeneration plants, which some airports have.[264]

Aside from cap-and-trade, CARB has also been developing other strategies that affect airports, including requirements for emissions reductions in various vehicles used by airports, imposition of statewide restrictions on the use of refrigerants, and requirements for greater energy-efficiency measures and renewable energy use.[265]

In the future, a variety of state standards designed to achieve emissions-reduction targets may emerge, but many elements of such standards would likely be preempted by federal law. Nonetheless, these requirements may shape how airports report and credit GHG reduction projects. They may also support airport arguments that GHG emissions efforts are proprietary in nature—the argument would be that airport GHG-reduction measures promote compliance with existing or future environmental laws and regulations that might otherwise constrain operations or growth.

2. State Low-Carbon Fuels Programs

States may also seek to reduce GHG emissions produced by combustion engines through low-carbon fuel requirements. Once again, California has been a leader in the development of low-carbon fuels initiatives. Following California's lead, 11 Northeast and Mid-Atlantic states have signed a memorandum of agreement to adopt a regional low-carbon-fuel framework.[266] However, as explained below, recent litigation challenging California's low-carbon rules has cast some doubt on states' ability to implement such measures.

California's Executive Order S-01-07 ordered the establishment of a Low Carbon Fuel Standard for transportation fuels. It directed several state agencies and entities, including CARB, to develop protocols for measuring the "life-cycle carbon intensity" of transportation fuels.[267] In April 2010, CARB adopted a final Low Carbon Fuel Standard regulation requiring lower carbon content in transportation fuels used in California.[268] Under the Low Carbon Fuel Standard, if a fuel provider's carbon intensity score falls below a statewide standard, it generates credits. If a provider's score is above the standard, it generates a deficit, which must

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[259] PEW CENTER ON GLOBAL CLIMATE CHANGE & PEW CENTER ON THE STATES, CLIMATE CHANGE 101: STATE ACTION 7 (Jan. 2009), *available at* http://www.pewclimate.org/docUploads/Climate101-State-Jan09_0.pdf.

[260] A.B. 32, California Global Warming Solutions Act of 2006, 2005-06 Leg. (Cal. 2006); CAL. HEALTH & SAFETY CODE § 38550.

[261] *Id.*

[262] A state court judge enjoined CARB from taking further action on cap-and-trade in Ass'n of Irritated Residents v. Cal. Air Res. Bd., CPF-09-509562 (Sup. Ct. Cal. Mar. 18, 2011). The injunction was later overturned by the California Supreme Court and CARB was allowed to proceed. Ass'n of Irritated Residents v. Cal. Air Res. Bd., S195112, 2011 Cal. LEXIS 9547 (Cal. Sept. 28, 2011).

[263] CARB, Rulemaking to Consider the Adoption of a Proposed California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation, Including Compliance Offset Protocols, http://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm (last visited June 14, 2012).

[264] CAL. CODE REGS. tit. 17, § 95811(a)(2).

[265] CARB, Facts About California's Climate Plan (Dec. 25, 2010), *available at* http://www.arb.ca.gov/cc/cleanenergy/clean_fs2.pdf.

[266] Northeast/Mid-Atlantic States Low Carbon Fuel Standard Program (Dec. 31, 2008), *available at* http://www.nescaum.org/documents/northeast-and-mid-atlantic-states-lcfs-letter-of-intent.pdf/ (Connecticut, Delaware, Maine, Maryland, Massachusetts, New York, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Vermont).

[267] CAL. EXEC. ORDER NO. S-01-07 (Jan. 18, 2007), *available at* http://www.arb.ca.gov/fuels/lcfs/eos0107.pdf.

[268] Rocky Mountain Farmers Union v. Goldstene, cv-F-09-2234 LJO DLB, at 3–4, 2011 U.S. Dist. LEXIS 149593 (E.D. Cal. Dec. 29, 2011).

be paid for by the provider's own accumulated credits or by purchasing credits from other entities.[269] Although this rule exempts transportation fuel used in aircraft,[270] it applies to gasoline or diesel used in airport vehicles. If implemented, the rule could affect airports by establishing a new emissions baseline that would reduce the potential scope of credits from other airport-related emissions-reducing activities. It could also affect the aviation fuel market by affecting the price and marketability of other products refined from crude oil.

Enforcement of the Low Carbon Fuel Standard has been subject to legal challenge. In December 2011, a federal district court in California found that the Low Carbon Fuel Standard was unconstitutional and prohibited its enforcement.[271] The court held that the Low Carbon Fuel Standard violated the dormant Commerce Clause because it discriminated against out-of-state corn ethanol producers and impermissibly regulated beyond the borders of California.[272] Under the Low Carbon Fuel Standard, Midwest ethanol providers' carbon intensity scores were higher because of the additional GHG emissions associated with transporting their fuel from out of state and because of the heavy use of coal to generate electricity in the Midwest.[273] CARB appealed this decision to the Ninth Circuit Court of Appeals, which recently lifted the injunction, allowing enforcement to continue while the case moves forward on the merits.[274]

H. Federal and State Regulations and Requirements Relating to Renewable Energy Projects

Federal and state laws applicable to energy projects and utilities generally could affect some larger renewable energy projects at airports, especially if they provide power to the electricity grid beyond the airport. Federal and state laws, regulations, and policies may also create financial incentives for renewable energy production.

1. Federal Laws

a. Federal Energy Regulatory Commission.—The Federal Energy Regulatory Commission (FERC) has regulatory jurisdiction over facilities for the transmission of electric energy in interstate commerce and the sale of electric energy at wholesale in interstate commerce. FERC does not generally have jurisdiction over facilities used for the generation of electric energy, for local distribution, for transmission of electric energy in intrastate commerce, or facilities for transmission of electric energy consumed wholly by the transmitter.[275] However, FERC does have authority over the rates charged for transportation of jet fuel and other products via interstate pipelines. It is unclear at this time whether this will become an issue for future bio-jet fuel projects. FERC authority is unlikely to apply to airport-related renewable energy projects, but should still be considered to ensure that FERC requirements are not triggered.

b. Public Utility Regulatory Policies Act of 1978.—The Federal Public Utility Regulatory Policies Act of 1978 (PURPA)[276] encourages small-scale power production and requires electric utilities to purchase electricity from certain qualifying small facilities that produce power. Qualifying small power production facilities under PURPA are defined as generating facilities of 80 megawatts or less whose primary energy sources are renewable, biomass, waste, or geothermal, and that meet other regulatory requirements, as well as some cogeneration facilities.[277] PURPA has created a market for power generated by qualifying facilities where such generation is cost-competitive with conventional utility-generated power. PURPA sets the wholesale price for qualifying facility-generated energy to the "incremental cost to the utility of alternative energy sources."[278] Qualifying facilities under PURPA may also be relieved of certain obligations under a variety of state or federal regulations.[279]

Some airports contemplating renewable power projects may be able to benefit from PURPA, because it provides a market and regulated pricing structure for some generated renewable or cogeneration power. This can reduce some of the market and regulatory uncertainty associated with investments in this type of power.

2. State Laws

a. Public Utility Regulation.—State and federal regulations often critically affect project economics for renewable projects. As a general matter, state public utility laws may apply to airport renewable energy projects to the extent that the project sponsor is regulated as a public utility or if the project would be connected to the system of a regulated public utility. State laws differ regarding the scope of potential regulation and applicability.

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[269] *Id.* at 5.

[270] CAL. CODE REGS. tit. 17, § 95480.1(d)(i).

[271] *Rocky Mountain Farmers Union,* 2011 U.S. Dist. LEXIS 149593.

[272] *Id.*

[273] *Id.*

[274] Rocky Mountain Farmers Union, et al. v. Goldstene, No. 1:09-cv-02234-LJO GSA (9th Cir. Apr. 23, 2012); CARB, LCFS Enforcement Injunction is Lifted, *available at* http://www.arb.ca.gov/fuels/lcfs/LCFS_Stay_Granted.pdf (Apr. 24, 2012).

[275] 16 U.S.C. § 824(b)(1).

[276] *See* 16 U.S.C. § 824a-3(a)(2).

[277] FERC, What Is a Qualifying Facility?, http://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp (Last visited June 14, 2012).

[278] 16 U.S.C. § 824a-3(b).

[279] FERC, What are the Benefits of QF Status?, http://www.ferc.gov/industries/electric/gen-info/qual-fac/benefits.asp (Sept. 30, 2010) (listing of relief from regulatory burdens for qualifying facilities).

Many states require power generation and transmission facilities larger than a *de minimis* size to comply with public utilities regulations in the state. For example, public utilities commissions may require developers of some proposed energy generation, distribution, or transmission projects meeting certain thresholds to apply for certificates of convenience and necessity.[280] In some states, municipal power producers (as opposed to investor-owned utilities) are subject to little or no state public utilities commission oversight. State laws may also require utility companies to purchase power produced by small producers, consistent with PURPA, as well as regulate the terms by which such connections will be made.[281] The process through which renewable energy systems connect directly with the electric distribution grid is known as interconnection and is generally governed at the state level.[282] Forty states have established statewide interconnection standards.[283]

Examples of some additional issues or utility programs that might impact airport renewable energy projects are discussed below.

b. Demand Side Management.—State laws may require utilities to engage in demand side management (DSM), which seeks to reduce electricity use through means such as education or offering financial incentives for conservation. Where airports purchase power from utilities subject to DSM requirements, they may be able to take advantage of financial incentives for energy conservation or efficiency upgrades. DSM programs may also offer free or reduced-cost energy audits to help identify opportunities to improve energy efficiency.

c. Energy Service Companies.—Many states have active energy service companies, which are private businesses that, among other activities, frequently investigate, plan, develop, install, and arrange financing for projects to generate energy savings for a client. Clients generally pay energy service companies fees for these services out of realized energy savings, creating a strong financial incentive for energy service companies to seek energy savings. Energy service companies may be able to offer airports up-front financing for energy-efficiency projects and some sharing of risks associated with project payback.

d. Renewable or Alternative Energy Portfolio Standards.—As of 2010, 36 states have implemented renewable portfolio standards (RPS) or alternative energy portfolio standards (AEPS) requiring that electric utilities generate or purchase some proportion of electricity they sell from renewable or alternative energy sources.[284] In some cases, state standards include requirements associated with the type of power (e.g., solar versus wind) and create incentives for particular types of renewable power. RPSs and AEPS's could have a significant effect on the economics of airport-related renewable power projects.

Utility compliance with RPS or AEPS requirements is often demonstrated through transactions in which renewable or alternative energy generators provide utilities with renewable energy credits (REC). RECs reflect the generation of a certain amount of renewable electricity and can be unbundled from the sale of electricity itself. Utilities subject to an RPS or AEPS collect or buy RECs to demonstrate compliance. Some RECs are also purchased voluntarily by companies, governments, or individuals. Frequently, third parties purchase and sell RECs in the open trading market. In areas with REC markets, airports sponsoring renewable-power projects may be able to sell RECs directly to utilities to help them meet RPS or AEPS requirements, where relevant, or on the open market. Alternatively, power purchase agreements for power projects on airports will specify who will own the RECs for purposes of meeting state RPS requirements. These REC provisions can significantly affect project economics, because they are valuable to utilities subject to RPS and AEPS requirements, as well as some other parties seeking to encourage renewable power development.[285]

e. Feed-In Tariffs/Net Metering.—Net metering programs and feed-in tariffs promote renewable energy production. Net metering is a program for energy consumers who generate energy and are connected to the grid. When local energy production exceeds the power needed at the time by the producer (like a house or an airport), the power is available for use in the larger grid. Net metering allows system owners to receive retail credit for energy generated in excess of energy consumed. This retail credit can be much more lucrative than wholesale power prices that would otherwise be available. This can significantly improve the economics of a power project at an airport. As of 2009, 42 states had net metering programs.[286]

Similarly, in some states, feed-in tariffs allow nonutility energy generators to supply power to the electric grid and sell energy produced to local utilities

[280] *See, e.g.,* IDAHO CODE ANN. § 61-526; 4 COLO. CODE REGS. § 723-3102.

[281] *See, e.g.*, CONN. GEN. STAT. § 16-243a; 4 COLO. CODE REGS. §§ 723-3900, et seq.

[282] NETWORK FOR NEW ENERGY CHOICES AND THE VOTE SOLAR INITIATIVE, FREEING THE GRID 7 (2009), http://www.newenergychoices.org/uploads/FreeingTheGrid2009.pdf.

[283] *Id.* at 12.

[284] Pew Center on Global Climate Change & Pew Center on the States, Renewable & Alternative Energy Portfolio Standards (Oct. 27, 2010), *available at* http://www.pewclimate.org/sites/default/modules/usmap/pdf.php?file=5907; *see, e.g.*, 4 COLO. CODE REGS. §§ 723-3650–723-3699. RPS requirements in Colorado and Minnesota have been challenged judicially, but no decisions have been rendered as of the end of 2011.

[285] *See* ACRP Report 57, *The Carbon Market: A Primer for Airports*, for a more detailed discussion of REC and carbon markets, and the potential opportunities and challenges to an airport's participation in these markets. http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_057.pdf.

[286] NETWORK FOR NEW ENERGY CHOICES AND THE VOTE SOLAR INITIATIVE, FREEING THE GRID 8 (2009), http://www.newenergychoices.org/uploads/FreeingTheGrid2009.pdf.

through long-term contracts at preferential prices. Feed-in tariffs may have a broader reach than PURPA, discussed above at Section III.H.1.b. To the extent that this is true, public utilities commissions may be able to establish prices higher than under PURPA, for example, to further incentivize renewable power production.[287]

f. Siting.—There is great variety among state permitting programs for renewable (and conventional) energy projects, although many of these state programs apply only to very large projects with greater generation capacity than that of typical airport projects. However, as airports implement larger, more aggressive projects, it is possible that airports may cross some of these thresholds. In some states, a state agency has primary siting authority over renewable energy projects, while in other states, local governments take the lead role in managing siting through application of zoning or land use powers.[288]

The types of state agencies that may have authority over siting of renewable energy projects include public utilities commissions, land-use authorities, municipalities, state siting boards, and environmental agencies. As an example, Ohio vests siting authority in the Ohio Power Siting Board for wind projects with generating capacity greater than or equal to 50 megawatts.[289] Ohio's siting process requires an application by the project sponsor, a staff investigation of the project, a public hearing near the proposed site, an adjudicatory hearing by the Ohio Power Siting Board, and Board issuance of a certificate.[290] In some cases, a state-issued permit or certificate may serve as a "one-stop" comprehensive or consolidated permit that obviates the need to secure other state or local permits.[291]

g. Local Siting Laws and Ordinances.—A variety of local ordinances and requirements can impact renewable energy projects, and local approvals may be required before these projects can move forward. Local zoning laws may prescribe rules that affect the potential for renewable energy generation. They might limit certain land uses (such as utility-scale power generation) to prescribed areas; govern the height, orientation, and size of structures; establish setbacks; specify the percentage of a development area that may be occupied by structures; govern the intensity of land use; and even address the potential for utilization of renewable energy sources.[292] For example, biofuel plants may be considered to be an industrial use that may or may not be allowed on or near an airport.

Local governments sometimes impose, as an exercise of their zoning and land use power, a moratorium on certain renewable energy projects. Local governments may bar such projects in some zones, classify such projects as a conditional use, require a special permit or variance, or subject projects to overlay zone requirements or landscaping requirements.

h. Local Safety Standards.—In general, local governments have significant leeway to require safety standards for airports and other entities through building, mechanical, and safety codes; local governments may also require permits for use of local access roads. This power generally does not extend to the airfield and aircraft operations, but can cover terminals, buildings, and landside infrastructure. Exercise of this authority in these contexts is generally not preempted by federal law.

Local safety standards could include mechanical, building, and electrical codes that affect smaller wind turbines, solar arrays, and other facilities. For example, some state and local governments require use of the National Electrical Code[293] for construction projects. Article 690 of the National Electrical Code provides standards for solar PV systems. The State of Florida's building code contains a number of requirements related to rooftop structures, which could affect rooftop wind turbines or PV systems.[294]

Some building owners in nonairport contexts have experienced difficulties with permitting small-scale wind projects due to code-driven concerns about whether turbines on buildings could throw ice fragments, drop broken parts, or pose other safety threats.

I. State and Local Land Use and Zoning Authority Over Airport Development (Other than Renewable Energy)

1. Land Use and Zoning Power

State and local entities may attempt to exercise land use and zoning authority over airport-related GHG-mitigation projects other than renewable energy efforts. For example, in Colorado, the Areas and Activities of State Interest Act allows local governments to designate certain areas and activities, including site selection for airports and mass transit facilities, as "matters of state interest" and to require permits for designated activities.[295] Similarly, the California Public Utilities Code Section 21661.6 requires airports seeking to ex-

[287] National Rural Electric Cooperative Association, *Feed-In Tariffs* 3 (2010), *available at* http://www.docstoc.com/docs/26031562/Feed-In-Tariffs-Issue-Paper (follow download instructions).

[288] *See, e.g.,* COLO. REV. STAT. §§ 29-20-101 to -108 (granting localities authority to regulate land uses by utilities).

[289] AMERICAN WIND ENERGY ASSOCIATION, WIND ENERGY SITING HANDBOOK 4-33 (2008), *available at* http://www.awea.org/sitinghandbook/downloads/Chapter_4_Regulatory_Framework.pdf.

[290] Ohio Power Siting Board, Ohio Power Siting Statute Process Flowchart (2010), *available at* http://www.opsb.ohio.gov/emplibrary/files/OPSB/flowchart.pdf.

[291] AMERICAN WIND ENERGY ASSOCIATION, *supra* note 289, at 4-35.

[292] *See, e.g.,* N.J. STAT. ANN. § 40:55D-65.

[293] National Fire Protection Association, National Electrical Code of 2008, http://www.garnernc.gov/Publications/Inspections/2008%20National%20Electrical%20Code.pdf.

[294] FLA. BLDG. CODE ch. 15 (2007).

[295] COLO. REV. STAT. §§ 24-65.1-101 to -502.

pand their boundaries for airport purposes to seek and secure the approval of the underlying jurisdiction with land use authority.[296]

Notwithstanding the federal preemption of state and local regulation of prices, routes, and services of air carriers, local governments generally may use their zoning and land use authority to control the siting of new airports and the physical expansion of airports onto new land, unless such efforts affect aircraft operations.[297] Several courts have upheld local zoning and land use regulations that affected the expansion of an airport onto property outside the existing airport's boundaries.[298] There is little judicial guidance regarding whether federal preemption would affect the ability of local entities to regulate nonaeronautical activities and land use on an airport (e.g., rental car facilities, carbon sequestration projects, or transit facilities).

2. Local Safety Standards

As with renewable energy projects, local building, electrical, mechanical, and safety codes are likely to apply to airport GHG-mitigation projects. Local codes may not account for or reflect up-to-date energy efficiency or other measures and could stop or slow down the implementation of some measures. Alternatively, local codes may require more stringent efficiency measures than airports had planned. For example, in early 2010, the California Building Standards Commission approved the mandatory Green Building Standards Code,[299] which will require all new buildings in the state, including those at airports, to be more energy efficient and environmentally responsible. The Code will require each new building to install low pollutant-emitting materials, and will require each new nonresidential building over 10,000 ft to undergo a design-to-construction "commissioning" process, to ensure that the building meets the owner's project requirements, which include efficiency goals.[300]

Airports will need to examine whether particular projects may be subject to state and local zoning, siting, and permitting requirements, as well as whether some of these requirements may be preempted by federal regulation.

[296] CAL. PUB. UTIL. CODE § 21661.6; *see also City of Burbank v. Burbank-Glendale-Pasadena Airport Auth.*, 72 Cal. App. 4th 366, 85 Cal. Rptr. 28 (1999).

[297] *See* 49 U.S.C. § 41713(b)(1); Price v. Charter Twp. of Fenton, 909 F. Supp. 498, 503–04 (E.D. Mich. 1995) (township could not attempt to regulate flight operations under the guise of using its zoning power).

[298] *See, e.g.,* City of Cleveland v. City of Brook Park, 893 F. Supp. 742 (N.D. Ohio 1995); City of Burbank v. Burbank-Glendale-Pasadena Airport Auth., 72 Cal. App. 4th 366, 85 Cal. Rptr. 2d 28 (1999).

[299] CALIFORNIA BUILDING STANDARDS COMMISSION, 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE (2010), *available at* http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf.

[300] *Id.*

J. Federal National Environmental Policy Act and Comparable State-Level Requirements

Both federal and state environmental review requirements will affect many airport projects designed to reduce GHGs. Many GHG-reducing projects will not have significant effects on the environment, so these environmental review requirements will be minimal. However, other projects, like airfield improvements, could involve environmental effects that require much more extensive review.

1. Federal National Environmental Policy Act

a. Generally.—Major airport projects that require amendment of the ALP, AIP funding, approval of PFC use authority, or certain other federal approvals can trigger National Environmental Policy Act (NEPA) requirements. NEPA compliance is governed by both Council on Environmental Quality (CEQ) and FAA regulations. CEQ regulations require the preparation of an Environmental Impact Statement (EIS) for "major Federal actions significantly affecting the quality of the human environment."[301] A federal action must be a "legally relevant cause" of the effect to be subject to NEPA.[302] Environmental analyses must address not only direct effects, but also indirect effects that are "reasonably foreseeable."[303] Cumulative impacts, "which result[] from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions," must also be considered.[304]

If there are no significant impacts or there is uncertainty regarding whether there are significant impacts, agencies may prepare Environmental Assessments (EAs) to determine whether a full-scale EIS is required. Where the agency finds that the project will not have a significant impact on the environment, no EIS is necessary.[305] In addition, for classes of actions that do not "individually or cumulatively have a significant effect on the environment," agencies may develop categorical exclusions. Categorical exclusions are specified in agency regulations or orders and involve minimal effort, as compared to EISs or EAs.[306]

Some GHG-reduction projects are likely to involve great enough impacts to resources that they would require EAs or EISs under NEPA, including projects that may significantly affect air emissions, endangered species, wetlands, or other protected resources. However, many projects may be eligible for categorical exclusions. FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*,

[301] 42 U.S.C. § 4332.

[302] U.S. Dep't of Transp. v, Public Citizen, 541 U.S. 752, 769, 124 S. Ct. 2204, 2216, 159 L. Ed. 2d 60, 80 (2004).

[303] 40 C.F.R § 1508.8.

[304] 40 C.F.R. § 1508.7.

[305] 40 C.F.R. § 1501.4.

[306] 40 C.F.R. § 1508.4.

provides FAA's NEPA policies and procedures for airports.[307] These regulations authorize categorical exclusions for some categories of projects that include potential GHG emissions-reduction projects, including:

- Minor airfield improvements: aircraft parking areas, roads, and storage areas.
- Airfield lighting.
- Construction or expansion of cargo buildings.
- General landscaping.
- Low emission technology equipment.
- Parking areas.
- Passenger handling buildings.
- Repair and maintenance.
- Replacement structures.[308]

However, it is important to note that even if a project fits within one of these categories, a categorical exception would not be available if there are extraordinary environmental circumstances, including the presence of endangered species, certain wetland impacts, or effects on historic resources.

b. Consideration of Climate Change Under NEPA.—The effects of projects on energy use and GHG emissions should be considered in the NEPA process. CEQ regulations have long provided that NEPA analyses should address the "[e]nergy requirements and conservation potential of various alternatives and mitigation measures."[309] More recently, CEQ has considered how to address climate impacts under NEPA. In January 2012, the FAA also issued a guidance memorandum on considering GHGs under NEPA.[310]

CEQ's attention to climate impacts follows litigation challenging NEPA actions for lack of consideration of climate change impacts.[311] In perhaps the most important federal appellate decision on climate change analyses, the Ninth Circuit held that NHTSA had to address the effects of a fuel economy regulation on climate change during its environmental review process.[312] The court overturned NHTSA's decision not to conduct an EIS because petitioner environmental groups demonstrated a "substantial question of whether the Final Rule *may* significantly affect the environment" through climate change impacts.[313] "The impact of GHG emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."[314]

In August 2011, the Ninth Circuit issued another opinion that shed light on the evaluation of climate change in NEPA documents relating to airport projects. In that case, the court upheld an FAA EA and its determination that it did not need to undertake an EIS for the expansion of an airport runway. The EA had stated that the new runway would not cause significant GHG emissions because operations at the airport represented less than 1 percent of U.S. aviation activity.[315] The plaintiffs asserted that the EA was inadequate because the GHG analysis was not specific to the location. The court rejected this argument.[316] The court stated that while "ample evidence" existed to demonstrate a causal connection between GHGs and global warming, the FAA's EA was adequate because the runway's GHG impact would not be "locally-quantifiable…given the global nature of climate change."[317]

In February 2010, the CEQ issued draft guidance regarding how GHGs should be considered in NEPA documents.[318] The CEQ guidance confirmed an expanding practice that climate-related issues should be addressed in NEPA documents and provided some additional guidance regarding how it should be done. Among other things, the draft CEQ guidance stressed the need to consider alternatives and mitigation measures that reduce climate impacts.[319] This draft guidance will drive greater consideration of GHG-reduction measures for some airfield, terminal, and other projects. Recently, FAA also issued similar guidance.[320]

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[307] FEDERAL AVIATION ADMINISTRATION, Order 5050.4B, NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) IMPLEMENTING INSTRUCTIONS FOR AIRPORT PROJECTS (2006), *available at* http://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/.

[308] *Id.* at 6–8, tbl. 6-1.

[309] 40 C.F.R. § 1502.16.

[310] Memorandum from Julie Mark, Manager, Environmental Policy and Operations, prepared by Thomas Cuddy, FAA, Considering Greenhouse Gases and Climate Under the National Environmental Policy Act (NEPA): Interim Guidance (Jan. 12, 2012), *available at* http://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/guidance/media/NEPA_GHG_Guidance_Final.pdf.

[311] For a comprehensive discussion of early NEPA-related climate change litigation, *see* MICHAEL B. GERRARD, GLOBAL CLIMATE CHANGE AND U.S. LAW, ABA SECTION OF ENVIRONMENT, ENERGY, AND RESOURCES, ABA Pub. (2007).

[312] Ctr. for Biological Diversity v. NHTSA, 538 F.3d 1172 (9th Cir. 2007); *see also* Mid States Coal. for Progress v. Surface Transp. Bd., 345 F.3d 520 (8th Cir. 2003) (EIS for a project to build a rail line to transport coal from mines in Wyoming to power plants in Minnesota and South Dakota should have considered air emissions, including CO_2, from the power plants).

[313] Ctr. for Biological Diversity v. NHTSA, 538 F.3d 1172, 1225 (9th Cir. 2007) (emphasis in original).

[314] *Id.* at 1217.

[315] Barnes v. U.S. Dep't of Transp., 655 F.3d 1124, 1130 (9th Cir. 2011).

[316] *Id.* at 1139.

[317] *Id.* at 1140.

[318] Memorandum from Nancy Sutley, Chair, Council on Environmental Quality, for Heads of Federal Departments and Agencies, Re: Draft Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (Feb. 18, 2010), *available at* http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.doc.

[319] *Id.*

[320] Memorandum from Julie Mark, Manager, Environmental Policy and Operations, prepared by Thomas Cuddy, FAA, Considering Greenhouse Gases and Climate Under the

2. State Environmental Review Requirements ("Little NEPAs")

State environmental review requirements will also often apply to projects to mitigate GHGs at airports. They may also require the application of such mitigation measures for other projects at airports. Fifteen states and the District of Columbia have enacted "little NEPAs" modeled on the federal NEPA. Some little NEPAs apply only to state agencies, while others also apply to local agencies, including in California, New York, Massachusetts, Washington, and Minnesota.[321] State and local operators of airports may be subject to environmental review requirements, depending on the state.

As of 2009, at least 16 states, the District of Columbia, and two U.S. territories required some level of environmental review: Arkansas, California, Connecticut, District of Columbia, Georgia, Guam, Hawaii, Indiana, Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, North Carolina, Puerto Rico, South Dakota, Washington, and Wisconsin.[322]

A comprehensive examination of all state NEPA-like statutes is beyond the scope of this digest. However, a brief discussion of four states' environmental review requirements follows for illustrative purposes.

a. California Environmental Quality Act.[323]— California's Environmental Quality Act (CEQA) requires state and local agencies to prepare impact reports on "any project which they propose to carry out or approve that may have a significant effect on the environment."[324] A "project" is defined as an "activity which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment."[325] For review to be required, projects must be undertaken or supported by a public agency or involve the issuance of certain permits or entitlements.[326]

California's environmental review requirement contains an action-forcing element that NEPA lacks. CEQA states that "public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects…."[327] However, the statute also provides that "in the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof."[328] This requirement could be significant to GHG-reducing projects if they involve significant impacts to other resources, like species or wetlands. CEQA's mitigation requirement is likely to drive more attention to measures that could reduce the GHG impacts of airport projects in California.

California Senate Bill 97, enacted in 2007, amended CEQA to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis.[329] The legislation directed the Office of Planning and Research to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions."[330] The California Natural Resources Agency adopted these amendments, which took effect on March 18, 2010.[331]

Under these guidelines, "[l]ead agencies should determine whether GHGs may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source."[332] Agencies must also "assess whether those emissions are individually or cumulatively significant."[333] Determinations of significance thresholds are left to agencies, and should include a good faith effort to "describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project."[334] In accordance with the action-forcing nature of CEQA, the agency "must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions" if GHG emissions from the project as proposed are "potentially significant."[335]

An example of how these regulations have played out in the airport context is useful. Beginning in 2006, the San Diego Regional Airport Authority undertook an

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National Environmental Policy Act (NEPA): Interim Guidance (Jan. 12, 2012), available at http://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/guidance/media/NEPA_GHG_Guidance_Final.pdf.

[321] DANIEL R. MANDELKER, NEPA LAW & LITIGATION § 12.1-12.2, Clark, Boardman, Callaghan (2010).

[322] ARK. CODE ANN. § 8-1-101; CAL. PUB. RES. CODE §§ 21000 to 21177; CONN. GEN. STAT. ANN. §§ 22a-1 to 22a-1h; D.C. CODE ANN. §§ 8-109.1 to 8-109.11; GA. CODE ANN. §§ 12-16-1 to 12-16-8; GUAM EXEC. ORDER NO. 96-26 (1996); HAW. REV. STAT. §§ 343-1 to 343-8; IND. CODE ANN. §§ 13-12-4-1 to 13-12-4-10; MD. CODE ANN. NAT. RES. §§ 1-301 to 1-305; MASS. GEN. LAWS ANN. ch. 30, §§ 61, 62 to 62H; MINN. STAT. ANN. §§ 116D.01 to 116D.11; MONT. CODE ANN. §§ 75-1-101 to 75-1-105; 75-1-201 to 75-1-208; N.J. EXEC. ORDER NO. 215 (1989); N.Y. ENVTL. CONSERV. LAW §§ 8-0101 to 8-0117; N.C. GEN. STAT. §§ 113A-1 to 113A-13; P.R. LAWS ANN. tit. 12, §§ 1121 to 1127; S.D. CODIFIED LAWS §§ 34A-9-1 to 34A-9-13; WASH. REV. CODE §§ 43-21C.010 to 43-21C.910; WIS. STAT. ANN. §§ 1.11 et seq.

[323] CAL. PUB. RES. CODE §§ 21000–21177.

[324] *Id.* § 21100(a).

[325] *Id.* § 21065.

[326] *Id.* § 21065.

[327] *Id*. § 21002.

[328] *Id*. § 21002.

[329] STATE OF CALIFORNIA, GOVERNOR'S OFFICE OF PLANNING AND RESEARCH, TECHNICAL ADVISORY: CEQA AND CLIMATE CHANGE: ADDRESSING CLIMATE CHANGE THROUGH CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) REVIEW 3 (June 19, 2008), *available at* http://www.capcoa.org/climatechange/upload/documents/Document-06-27-2008-OPR-Technical-Advisory-Publication-Ready-June-19-2008[1].pdf.

[330] *Id*.

[331] California Natural Resources Agency, CEQA Guidelines, http://ceres.ca.gov/ceqa/guidelines/ (last visited June 14, 2012).

[332] STATE OF CALIFORNIA, *supra* note 329, at 5.

[333] *Id.*

[334] CAL. CODE REGS. tit. 14, § 15064.4.

[335] STATE OF CALIFORNIA, *supra* note 329, at 5.

Airport Master Plan revision, including a Proposed Airport Land Use Plan designating future airport land uses. As part of this process, the airport considered undertaking several capacity expansion projects (such as construction of a new parking terminal). This process was subject to CEQA. In 2007, subsequent to the passage of Senate Bill 97, but prior to the update of California's CEQA regulations to reflect its requirements, the San Diego County Regional Airport Authority promulgated a revised Draft Environmental Impact Review for the master planning process. The revised Draft Environmental Impact Review discussed and analyzed existing and likely future GHG emissions from airport operations and growth, stating that the decision to do so was motivated by the possibility of future legislation.[336] However, the San Diego Regional Airport Authority did not include mitigation measures specifically designed to reduce GHG emissions associated with capacity increases at the airport.[337]

In response to the lack of proposed mitigation measures, and with a stated desire to avoid future litigation between the parties, California's Attorney General negotiated a memorandum of agreement with the San Diego Regional Airport Authority binding it to numerous GHG emissions-reduction commitments not included in the revised Draft or Final Environmental Impact Reviews.[338]

b. Massachusetts Environmental Policy Act.[339]—In Massachusetts, state entities are required by law to evaluate the environmental impact of state activities and use "all practicable means and measures to minimize environmental damage."[340] In 2007, the Massachusetts Executive Office of Energy and Environmental Affairs developed a Greenhouse Gas Emissions Policy after the Secretary of Energy and Environmental Affairs determined that environmental damage under the Massachusetts Environmental Policy Act (MEPA) "includes the emissions of greenhouse gases [GHGs] caused by projects subject to NEPA review."[341] For covered projects, the policy required quantification of project-related GHG emissions, and also required consideration of mitigation measures or project alternatives to reduce GHGs.[342]

In 2008, the Massachusetts General Assembly codified the Secretary's decision through enactment of the Massachusetts Global Warming Solutions Act of 2008, which provided: "[i]n considering and issuing permits, licenses and other administrative approvals and decisions, the respective agency, department, board, commission or authority shall also consider reasonably foreseeable climate change impacts, including additional greenhouse gas emissions, and effects, such as predicted sea level rise."[343]

The Massachusetts Executive Office of Energy and Environmental Affairs revised the Greenhouse Gas Emissions Policy in 2010, specifying that it applies to most projects subject to analysis under MEPA, excluding projects for which emissions are minimal.[344] Under the recently revised MEPA Greenhouse Gas Emissions Policy, project proponents are generally required to quantify direct and indirect GHG emissions associated with the preferred alternative, as well as to commit to and quantify the reductions benefits of mitigation measures.[345] The Secretary of Energy and Environmental Affairs may also exempt particular projects from emissions quantification requirements.[346] Examples of the types of projects that might qualify include renewable energy installations or zero-net energy projects.[347]

Project sponsors must also certify that they have completed mitigation to the Massachusetts Environmental Policy Office.[348] The GHG Emissions Policy expresses a preference for direct, on-site mitigation of GHGs; however, it also allows for the use of offsets when direct mitigation is not feasible.[349]

c. New York State Environmental Quality Review Act.[350]—Under New York State's State Environmental Quality Review Act (SEQRA), state and local agencies must prepare an EIS "on any action they propose or approve which may have a significant effect on the environment."[351] Impact statements should address the "effects of the proposed action on the use and conservation of energy resources, where applicable and significant."[352] State and local agencies in New York are increasingly paying attention to projects or plans that will increase GHG emissions.

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[336] SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY, AIRPORT MASTER PLAN DRAFT ENVIRONMENTAL IMPACT REPORT 5.19-2 (Oct. 2007), http://www.san.org/documents/amp/DEIR/_Final_San_Diego_EIR.pdf.

[337] *Id.*

[338] State of California, Office of the Attorney General, Brown Announces San Diego Airport Emissions Agreement (May 8, 20008), *available at* http://oag.ca.gov/news/press_release?id=1556 (last visited June 14, 2012).

[339] MASS. GEN. LAWS. ch. 30, §§ 61–62H.

[340] *Id.* § 61.

[341] MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS, SUMMARY OF THE FINAL REVISIONS TO THE MEPA GREENHOUSE GAS EMISSIONS POLICY AND PROTOCOl 1 (May 5, 2010), *available at* http://www.env.state.ma.us/mepa/downloads/GHG%20Policy%20FINAL%20Summary.pdf (last visited June 14, 2012).

[342] *Id.*

[343] MASS. GEN. LAWS. ch. 30, § 61.

[344] MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS, REVISED MEPA GREENHOUSE GAS EMISSIONS POLICY AND PROTOCOL 2-3 (2010), http://www.env.state.ma.us/mepa/downloads/GHG%20Policy%20FINAL.pdf.

[345] *Id.* at 2.

[346] *Id.* at 12.

[347] *Id.*

[348] *Id.*

[349] *Id.*

[350] N.Y. ENVTL. CONSERV. §§ 8-0101 to 8-0117.

[351] *Id.* § 8-0109(2).

[352] *Id.* § 8-0109(2)(g).

The New York State Department of Transportation was the first state department of transportation in the nation to require consideration of GHGs and energy in metropolitan planning organization analyses of their transportation plans.[353] The stated authority for this requirement is the 2002 State Energy Plan, which sets forth a goal of reducing statewide GHG emissions to 5 percent below 1990 levels by 2010 and 10 percent below 1990 levels by 2020.[354]

In a 2009 decision, the New York Fourth Appellate Division indicated that the effect of a proposed cogeneration plant on air emissions was a proper consideration under SEQRA.[355] The court held that the town planning board did not act arbitrarily or capriciously in denying the plant's application based on its conclusion that "serious increases in harmful emissions" from the plant would result in an "unacceptable adverse impact."[356] Carbon emissions were a focus of the town's findings, which examined even potential emissions from nonlocal fuel sources in determining that the plant could not achieve climate neutrality.[357]

d. Washington State Environmental Policy Act.[358]—Washington's State Environmental Policy Act (SEPA) uses the same language as NEPA to require state and local agencies to prepare impact statements on major actions that significantly affect the quality of the environment.[359] SEPA requires agencies to consider the effects of proposed projects on the environment, including the climate.[360]

The Washington Department of Ecology has developed recommendations on how existing SEPA requirements can be used to identify climate impacts.[361] In Washington State, a project checklist guides SEPA analysis.[362] Several checklist elements can be used to identify GHG emissions, including air emissions, vehicle trips per day, and energy use.[363] The Department of Ecology has also assembled a library of SEPA and SEPA-like analyses that have considered GHG emissions.[364]

For emissions quantification estimation methodologies, the Department of Ecology suggests that project sponsors look to the guidance of King County, which has an executive order that "requires and empowers King County Departments to evaluate the climate impacts of those actions being evaluated under authority of the State Environmental Policy Act (SEPA)."[365] Project sponsors may also develop their own methodologies.

Agencies must consider whether an action will result in "probable adverse significant impacts."[366] The Department of Ecology recognizes the difficulty in establishing bright-line significance thresholds, and suggests that project sponsors may mitigate emissions in efforts to have impacts deemed nonsignificant.[367]

K. General Environmental Laws that May Apply to Development or Energy Projects, Including at Airports

In addition to environmental review requirements, there are many substantive environmental laws that may apply to particular projects, such as the Endangered Species Act (ESA)[368] and the Clean Water Act (CWA).[369] Because of the wide potential range of GHG-reduction projects and project settings, the following discussion of laws are exemplary rather than exhaustive.

1. Endangered Species Act

The Federal ESA regulates activities affecting threatened and endangered species and their habitat.[370] Airport projects seeking to reduce GHG emissions may affect species, and thus implicate the ESA. For exam-

[353] TRANSPORTATION RESEARCH BOARD, TRANSPORTATION, LAND USE, AND AIR QUALITY CONFERENCE: SUMMARY OF PEER EXCHANGE, Orlando, Florida (July 9–11, 2007), *available at* http://climate.dot.gov/state-local/integration/chapter_05.html (last visited Jan. 27, 2011).

[354] Michael B. Gerrard, *SEQRA and Climate Change* 2 (draft, April 24, 2008), *available at* http://www.lawseminars.com/materials/08LUCCNY/luccny%20m%20gerrard%20revised_a.pdf.

[355] Matter of Laidlaw Energy and Envtl., Inc. v. Town of Ellicottville, 59 A.D. 3d 1084, 1085, 873 N.Y.S.2d 814, 815 (2009).

[356] *Id.*

[357] Silverberg Zalantis LLP, *New York State Says SEQRA Review Properly Considered Impacts of Greenhouse Gases*, CLIMATE CHANGE ATTORNEY BLOG (Mar. 1, 2009), http://www.climatechangeattorney.com/2009/03/new_york_court_says_seqra_revi.html.

[358] WASH. REV. CODE §§ 43.21C.010–43.21C.910 (2009).

[359] WASH. REV. CODE § 43.21C.030(c) (2009).

[360] WASH. ADMIN. CODE § 197-11-444 (2003).

[361] WASHINGTON DEPARTMENT OF ECOLOGY, GREENHOUSE GAS EMISSIONS AND SEPA–WORKING PAPER (2010), *available at* http://www.ecy.wa.gov/climatechange/sepa.htm.

[362] WASH. ADMIN. CODE § 197-11-960 (2003).

[363] WASHINGTON DEPARTMENT OF ECOLOGY, GREENHOUSE GAS EMISSIONS AND SEPA–WORKING PAPER 2 (2010), *available at* http://www.ecy.wa.gov/climatechange/sepa.htm.

[364] Washington Department of Ecology, SEPA and GHG Emissions–Resources and Links, http://www.ecy.wa.gov/climatechange/sepa_resources.htm (last visited Feb. 3, 2012).

[365] WASHINGTON DEPARTMENT OF ECOLOGY, GREENHOUSE GAS EMISSIONS AND SEPA–WORKING PAPER 3 (2010), *available at* http://www.ecy.wa.gov/climatechange/sepa.htm; KING COUNTY, PUT 7-10-1 (AEO), EXECUTIVE ORDER ON THE EVALUATION OF CLIMATE CHANGE IMPACTS THROUGH THE STATE ENVIRONMENTAL POLICY ACT (Oct. 15, 2007), http://www.kingcounty.gov/operations/policies/executive/utilitiesaeo/put7101aeo.aspx.

[366] WASHINGTON DEPARTMENT OF ECOLOGY, GREENHOUSE GAS EMISSIONS AND SEPA–WORKING PAPER 4 (2010), *available at* http://www.ecy.wa.gov/climatechange/sepa.htm.

[367] *Id.*

[368] Pub. L. No. 93-205, 87 Stat. 84 (1973), codified at 16 U.S.C. § 1531 et seq.

[369] Pub. L. No. 92-500, 86 Stat. 816 (1972), codified at 33 U.S.C. § 1251 et seq.

[370] 16 U.S.C. §§ 1531–44.

ple, wind turbines can affect certain bat and bird species, requiring incidental-take permits and/or Section 7 consultations.[371] Some wind projects have been enjoined under the ESA as a result of species concerns and failure to address the Act's requirements.[372] New transit or solar PV projects could be located on property that provides habitat for endangered or threatened animal or plant species. Airport sponsors of such projects and FAA will need to ensure that they are in full compliance with the ESA.

2. Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

Similarly, the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act[373] prohibit the harm, possession, or taking of migratory bird species, nests, and eggs and bald and golden eagles. As with the ESA, projects like wind turbines or other construction-related work could affect these species. Federal agencies have been working to provide more guidance regarding this issue. For example, in January 2011, the U.S. Fish and Wildlife Service issued draft guidance on eagle conservation with a focus on reducing harm from wind energy projects.[374]

3. National Historic Preservation Act

The National Historic Preservation Act[375] requires federal agencies to review impacts to historic and tribal resources. Physical construction associated with GHG-mitigation measures could affect historic resources covered by the Act. Similarly, historic preservation issues may arise in projects in or affecting historic buildings on an airport. For example, a project to replace elements of a historic terminal or other building for energy-efficiency purposes could trigger National Historic Preservation Act applicability.

4. Clean Water Act, Section 404

Section 404 of the CWA regulates obstructions to, fill in, and discharges to waters of the United States.[376] GHG-mitigation projects may involve construction that would fill wetlands or waters. For instance, an airport project to provide new taxiway or runway pavement to improve airport efficiency could require a CWA Section 404 permit if it required any fill in wetlands, streams, or other waters of the United States.

[371] U.S. GOV'T ACCOUNTABILITY OFFICE, WIND POWER: IMPACTS ON WILDLIFE AND GOVERNMENT RESPONSIBILITIES FOR REGULATING DEVELOPMENT AND PROTECTING WILDLIFE 35 (2005), *available at* http://www.gao.gov/new.items/d05906.pdf.

[372] *See, e.g.,* Animal Welfare Inst. v. Beech Ridge Energy, 675 F. Supp. 2d 540 (D. Md. 2009).

[373] 16 U.S.C. §§ 703–712; 16 U.S.C. §§ 668–668(d).

[374] U.S. Fish and Wildlife Service, Draft Eagle Conservation Plan Guidance, http://www.fws.gov/windenergy/docs/ECP_draft_guidance_2_10_final_clean_omb.pdf.

[375] 16 U.S.C. § 470 to 470-1.

[376] 33 U.S.C. § 1344.

IV. AIRPORT PRACTICES TO REDUCE GHG EMISSIONS AND POTENTIAL LEGAL IMPLICATIONS

This section provides an introduction to the legal issues that may arise for airports implementing specific GHG-reduction measures outlined in ACRP 56.[377] The discussion is organized by the ACRP 56 categories, because they cover the universe of GHG-mitigation measures based on experience and a review of literature and resources such as the Sustainable Aviation Guidance Alliance (SAGA) database and the 2011 ACRP Report 42, *Sustainable Airport Construction Practices*.[378]

This section especially focuses on those measures that were ranked highly in ACRP 56 as being able to deliver the most GHG reductions for the least cost.[379] It also identifies a representative set of other mitigation measures that raise significant, interesting legal issues. The examples examined below are demonstrative rather than exhaustive.

This section also relies on a 2010 U.S. Government Accountability Office (GAO) report, *Survey of Airport Officials on Environmental Issues* (the GAO Report),[380] which identifies the extent to which various environmental initiatives have been implemented at the largest U.S. airports. In preparing this report, GAO surveyed the 150 busiest U.S. airports in 2009 and received 141 responses.[381] The survey's broad scope and 94 percent response rate make the GAO Report a valuable resource for information on the environmental practices of large and medium hub commercial airports in the United States, including GHG-reduction measures.

It bears repeating that the listing of a particular measure in ACRP 56 or this section does not mean that it would be legal at all airports or any particular air-

[377] Where measures examined below are also ACRP 56 strategies, the ACRP 56 measure number is cross-referenced in brackets in the title. ACRP 56 is available at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_056.pdf.

[378] The Sustainable Aviation Guidance Alliance has prepared a database that identifies many very specific measures that are being undertaken to reduce GHGs and meet other sustainability goals, while the ACRP's Report 42 examines a number of sustainability practices that sponsors can employ during airport construction to reduce GHG emissions, https://www.transportationresearch.gov/dotrc/infrastructureandmaterials/Shared%20Documents/ACRP%2042%20-%20Sustainable%20Airport%20Construction%20Practices.pdf. *See* Sustainable Aviation Guidance Alliance, Sustainability Database, http://www.airportsustainability.org/database (last visited Jan. 18, 2011); AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, REPORT 42, SUSTAINABLE AIRPORT CONSTRUCTION PRACTICES (2011).

[379] *See* ACRP 56, tble. ES-05, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_056.pdf.

[380] U.S. GOV'T ACCOUNTABILITY OFFICE, E- SUPPLEMENT TO GAO-10-50, AVIATION AND THE ENVIRONMENT: SURVEY OF AIRPORT OFFICIALS ON AIRPORT ENVIRONMENTAL ISSUES (2010), *available at* http://www.gao.gov/special.pubs/gao-10-748sp/ (last visited Jan. 26, 2011).

[381] *Id.*

port. For example, it would currently be illegal for a U.S. airport to levy GHG-based landing fees that resulted in revenues in excess of aviation-related costs.[382] Additionally, it would probably not be legal in most circumstances to use airport revenues to offset airport emissions by buying more fuel-efficient city school buses. Further, certain green building measures may meet code requirements in some locales, but not others.[383]

The regulatory environment is continually evolving, particularly as it relates to control of GHG emissions. As a result, airports face considerable uncertainty in the short run as agencies and courts determine how to address climate impacts under federal and state regimes. Airports considering GHG-reduction measures should carefully evaluate relevant measures applicable in their local context at the time of action. The listing of a measure in this section does not constitute a policy recommendation for or against such a measure, even though this section does identify some of the reasons why airports have implemented or considered the measures.

A. Aircraft Operations

Aircraft and other operations on airfields can contribute significantly to overall GHG emissions at airports. Increasing their efficiency can reduce GHG emissions. The sweeping scope of federal preemption of state, local, and airport proprietary powers to affect aircraft operations and technology makes it difficult for airports to create large reductions of aircraft GHG emissions directly. However, there are a number of strategies that airports can employ—on their own or in conjunction with aircraft users and FAA—to reduce the environmental impact from activities on the airfield.

1. Provide Infrastructure for Preconditioned Air and Ground Power, and Minimize the Use of Auxiliary Power Units (ACRP 56 AF-01, AF-02)

Auxiliary power units (APUs) are small gas turbines typically mounted in the rear portion of the fuselage of most commercial aircraft. Aircraft operators use APUs for a variety of purposes, including powering onboard electrical and air circulation/conditioning systems before or during pushback from the gate. The combustion of jet fuel in APUs generates GHGs.[384]

As a result, many airports provide ground power and preconditioned air at their gates to reduce the need for APU usage and, consequently, GHGs and other air pollutants. Up to 85 percent of APU use can be reduced by providing ground power to aircraft.[385] This provides fuel savings for airlines and can reduce APU maintenance costs, while also offering significant CO_2 reduction benefits. For example, the Port of Seattle recently evaluated the effects of its installation of a centralized preconditioned-air system at Seattle-Tacoma Airport that will cover each of the airport's 81 gates by the end of 2012.[386] It estimates that the project will reduce emissions by more than 50,000 metric tons of CO_2 and create annual fuel savings of approximately 5 million gallons, worth $10 million.[387] Similarly, Zurich Airport found that installation of these units at 50 gates reduced annual CO_2 emissions by 33,000 metric tons.[388]

As discussed in Section III, federal grant assistance is available for the installation of preconditioned air and ground power at many airports through the VALE program. For example, Duluth International Airport will use a VALE grant to install preconditioned-air units at a new terminal's loading bridges.[389] These installations combined with a geothermal heating and cooling system in the new passenger terminal building will save 1,798,507 gallons of jet fuel over the next 20 years and significantly reduce aircraft emissions.[390]

The FAA has used AIP grants through the VALE program to fund gate power or preconditioned air projects at Detroit's Wayne County Airport, New York's Stewart International Airport, Pennsylvania's Erie International Airport, Pennsylvania's Philadelphia International Airport, Michigan's Gerald R. Ford International Airport, Kentucky's Cincinnati/Northern International Airport, Idaho's Boise Air Terminal, Pennsylvania's Lehigh Valley International Airport, and Washington's Seattle-Tacoma International Airport.[391] For each of these projects, project sponsors were

[382] *See* ACRP 56 AF-09, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_056.pdf.

[383] *Id.* at BP-08, BP-10.

[384] SUSTAINABLE AVIATION, AIRCRAFT ON THE GROUND CO_2 REDUCTION PROGRAMME 9 (2010), http://www.sustainableaviation.co.uk/pages/news/aircraft-on-the-ground-co2-reduction-programme-best-practice-guidance-published.html.

[385] AIR TRANSPORT ACTION GROUP (ATAG), BEGINNER'S GUIDE TO AVIATION EFFICIENCY 23 (2010), *available at* http://www.enviro.aero/Content/Upload/File/BGAE_referenceversion%281%29.pdf.

[386] Port of Seattle, Seattle-Tacoma Airport Receives Largest FAA Grant of its Kind to Reduce Air Emissions and Save Millions in Fuel Costs (Oct. 28, 1010), http://www.highlinetimes.com/2010/10/28/news/sea-tac-airport-receives-grant-reduce-greenhouse-?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+highlinetimes+(Highline+Times+%7C+Recent+Articles) (last visited June 14, 2012).

[387] *Id.*

[388] AIR TRANSPORT ACTION GROUP, BEGINNER'S GUIDE TO AVIATION EFFICIENCY 23 (2010), *available at* http://www.enviro.aero/Content/Upload/File/BGAE_referenceversion%281%29.pdf.

[389] Duluth International Airport, Duluth International Airport Receives $3.8 Million Grant from FAA Green Airport Program (Sep. 22, 2011), http://www.duluthairport.com/news.php?id=125&type=n (last visited Jan. 25, 2012).

[390] *Id.*

[391] Federal Aviation Administration, VALE Program Grant Summary FY 2005–FY 2010 (2010), *available at* http://www.faa.gov/airports/environmental/vale/media/VALE_grant_summary.pdf (last visited June 25, 2012). *See* § III.D.3 for more information regarding the VALE program.

required to obtain AERCs, established through state or local air agencies.[392]

Airports seeking to use AIP and PFC funds, rather than general revenue, for preconditioned-air and ground-power projects will need to ensure that their project proposals comply with AIP and PFC regulatory requirements.[393] For example, stand-alone emissions mitigation projects must secure AERCs to be eligible for AIP funding.[394] AIP funding also requires that gate electrification systems, where installed as a part of a stand-alone project, be airport-owned and for use only in airport activities.[395] FAA's regulations instruct sponsors of PFC-funded projects, where no additional gates or concourses are being constructed, to justify them based on "the continued need for the facility as well as the age, condition, or functional inadequacy of the existing facility."[396] Even where a project is undertaken for noncompetitive reasons, the impact of the terminal project on competition must be taken into consideration.[397]

In many circumstances, preconditioned-air and ground-power infrastructure reduce fueling and maintenance costs for airlines and airports compared to operation of less efficient APUs. In such cases, airlines are likely to desire ground power and preconditioned air, reducing the concern that they would challenge initiatives that provide the necessary infrastructure. More significant issues may arise if some tenants do not desire preconditioned air and ground power, or if airports seek to *require* use of facilities, especially if doing so would adversely affect the operation of aircraft or slow turn times at gates. Airlines may oppose such measures, perceiving them as interfering with exclusive federal control over aircraft operations.

Regardless, where airports seek to use federal funding to finance preconditioned-air or ground-power projects, NEPA would apply. State-level environmental review requirements, examined above at Section III.J.2, may also apply, depending on the state. While NEPA would apply, airport sponsors will likely qualify for a categorical exclusion under NEPA (at least if a stand-alone project) "if there are no 'extraordinary circumstances' associated with the project," under the exception category "construction or expansion of passenger handling facilities."[398] As part of the process for obtaining the exclusion, the FAA may require sponsors to complete a categorical exclusion checklist and undertake consultation with other agencies.[399] However, because gate electrification and preconditioned air take place in an already developed terminal and ramp environment, it is very unlikely that ground-power and preconditioned-air issues would create the type of extraordinary circumstances that would require more extensive environmental review (such as an EA), unless bundled with other projects.

Local zoning authority would likely be preempted, but local building, electrical, mechanical, or other codes are likely to apply.[400]

2. Design Airside Layout to Reduce Aircraft Delay and Surface Vehicle Congestion (ACRP 56 AF-03)

Airfield layouts have often evolved in a piecemeal fashion in response to existing infrastructure, immediate needs, and safety requirements. They are often not optimized for the efficient movement of aircraft in a manner that reduces delay (and, thus, generation of GHGs). Accordingly, there is potential to reduce aircraft delay and surface vehicle congestion through airside layout optimization as airports continue to modernize. This can involve taxiway, hold pad, terminal, runway, and other improvements to facilitate efficient movement of aircraft and reduce aircraft taxi and idle times. The primary objectives of such improvements include maximizing efficiency and capacity of the runway system, providing independent flows for arriving and departing aircraft, and providing convenient access to terminal/air cargo aprons and other facilities.[401]

Many airports have sought to undertake airside improvements to improve the efficiency of the airport and reduce congestion. Such measures could reduce the waste of fuel and, therefore, GHG emissions. Airports may seek to reduce GHG emissions by improving airside layout to maximize efficiency and capacity of the runway system, provide independent flows for arriving and departing aircraft, and provide more convenient access to terminal/air cargo aprons and other facilities.[402]

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[392] 49 U.S.C. § 47139(b).

[393] *See* § III.D.

[394] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK § 585(a) (2005), *available at* http://www.faa.gov/airports/resources/publications/orders/media/aip_5100_38c.pdf.

[395] *Id*. § 585(b).

[396] FEDERAL AVIATION ADMINISTRATION, Order 5500.1, PASSENGER FACILITY CHARGE § 4-8(b) (2001), *available at* http://www.faa.gov/documentLibrary/media/Order/PFC_55001.pdf.

[397] *Id.*

[398] FEDERAL AVIATION ADMINISTRATION, Order 5050.4B, NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) IMPLEMENTING INSTRUCTIONS FOR AIRPORT PROJECTS, Tble. 6-3 (2006), *available at* http://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/; FEDERAL AVIATION ADMINISTRATION, VOLUNTARY AIRPORT LOW EMISSION PROGRAM TECHNICAL REPORT 1-6 (2010) *available at* http://www.faa.gov/airports/environmental/vale/media/vale_techreport_v7.pdf.

[399] FEDERAL AVIATION ADMINISTRATION, Categorical Exclusions, http://www.faa.gov/airports/central/environmental/catex/ (last visited June 14, 2012).

[400] *See* § III.I.

[401] TORONTO PEARSON INTERNATIONAL AIRPORT, TAKING FLIGHT: THE AIRPORT MASTER PLAN 2008–2030, at 5:3 (2008), *available at* http://www.torontopearson.com/en/gtaa/masterplan/#.

[402] *Id.*

Airfield improvements that reduce airfield congestion are eligible for AIP and PFC funding.[403] If airport sponsors use AIP funds for such projects, they commit to AIP program-specific grant assurances for periods of 20 years or more. Regardless of the funding source, the improvements would need to be reflected on the ALP and trigger at least some environmental analysis under NEPA.[404] Depending on the scope of proposed improvements, and particularly if proposed capacity increases would substantially increase the number of flights or planes an airport could serve, extensive NEPA analysis may be required. A new runway, for example, requires at least an EA while a new runway in a Metropolitan Statistical Area requires preparation of a full EIS.[405]

Additionally, FAA advises airports seeking to use PFC funds for capacity-enhancing airfield projects to support estimates of capacity-enhancement project benefits in a manner consistent with information offered in environmental documents and based on identified, rather than speculative, demand.[406] If identified demand is not based on established operations, airports could support projects through written commitments to initiate such operations.[407]

Where airports are subject to state or local zoning authority, airports will need to consider how zoning requirements might affect airfield improvements.[408] Similarly, state or local permits may be required for airfield construction. Other substantive environmental laws like the ESA or the CWA may also apply.[409] For example, development of a new runway on previously undeveloped land might trigger review under state "little NEPAs" and endangered species acts. These substantive environmental laws can delay or increase the cost of airfield-related projects.

3. Implement Emission-Based Incentives and Landing Fees (ACRP 56 AF-09)

Emission-based landing fees are used in Europe to incentivize reductions in emissions. One revenue-neutral approach is to offer lower-emitting aircraft a discount on landing fees. A second approach is to generate revenue through landing fees, then use those revenues to reduce the contribution of aircraft operations to area emissions through the purchase of offsets or implementation of projects to reduce emissions. Switzerland and Norway have both enacted carbon taxes on domestic flights.[410] These approaches are not used in the United States and would raise a number of significant questions under U.S. airport law.

Under FAA rules, airports do not have explicit authority to impose surcharges on landing fees and fuel flowage fees to reduce emissions.[411] The FAA allows landing fees to vary to account for congestion under some limited circumstances, but it is unclear whether congestion pricing would be acceptable for the sole purpose of reducing GHG emissions. Landing fees are limited to a combination of a per-operation charge, which may account for the proportionally higher costs per passenger for aircraft with fewer seats, and a weight-based charge.[412] The per-operation component of the fee "may be justified by the effect of the fee on congestion and operating delays and the total number of passengers accommodated during congested hours."[413] Landing fees must be rational, economically justified, and revenue neutral, such that they do "not exceed the allowable costs of the airfield."[414] FAA's congestion pricing policy has survived a facial challenge in the D.C. Circuit that alleged that the policy was unreasonable, discriminatory, and preempted by the Airline Deregulation Act's prohibition on state and local authorities enacting laws or regulations related to a price, route, or service of an air carrier.[415]

Aside from the federal aviation laws, airlines or others may challenge emissions-related fees, particularly limitations that differentiate among aircraft based on their emissions profiles, on the basis that they are preempted by the CAA. The argument might be that airports are preempted from imposing regulations based on aircraft emissions because GHGs have been found to

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[403] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK § 607 (2005), *available at* http://www.faa.gov/airports/resources/publications/orders/media/aip_5100_38c.pdf. *See* § III.D.

[404] *See* § III.J.

[405] FEDERAL AVIATION ADMINISTRATION, Order 5050.4B, NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) IMPLEMENTING INSTRUCTIONS FOR AIRPORT PROJECTS, § 702(f), § 903(b)(2) (2006), *available at* http://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/.

[406] FEDERAL AVIATION ADMINISTRATION, Order 5500.1, PASSENGER FACILITY CHARGE § 4-8(b) (2001), *available at* http://www.faa.gov/documentLibrary/media/Order/PFC_55001.pdf.

[407] *Id.*

[408] *See* § III.I.

[409] *See* § III.K.

[410] United Kingdom House of Commons Select Committee on Environmental Audit, Memorandum from the Aviation Environment Federation: Taking Account of the Environmental Costs of Aviation (2003), http://www.publications.parliament.uk/pa/cm200203/cmselect/cmenvaud/672/3060408.htm (last visited Jan. 20, 2011).

[411] *See* § III.C.

[412] FEDERAL AVIATION ADMINISTRATION, POLICY REGARDING AIRPORT RATES AND CHARGES, 61 Fed. Reg. 31994, 32018 (June 21, 1996) (note that other portions of this policy were vacated in Air Transport Ass'n of America v. Dep't of Transp., 119 F.3d 38 (D.C. Cir. 1997), *amended by* 129 F.3d 625 (D.C. Cir. 1997)); FEDERAL AVIATION ADMINISTRATION, POLICY REGARDING THE ESTABLISHMENT OF AIRPORT RATES AND CHARGES § 2.1.4 (2008), *available at* http://www.faa.gov/airports/airport_compliance/media/airports_rates_charges_policy_with_amendments.pdf.

[413] FEDERAL AVIATION ADMINISTRATION, POLICY REGARDING THE ESTABLISHMENT OF AIRPORT RATES AND CHARGES, *supra* note 412, § 2.1.4(a).

[414] *Id.* § 2.1.4.

[415] Air Transport Ass'n v. U.S. Dep't of Transp., No. 08-1293 (D.C. Cir. July 13, 2008).

be air pollutants under the federal law.[416] Fee opponents may also argue that measures may constitute "access restrictions" subject to ANCA.[417] While ANCA does not apply to "peak period pricing programs where the objective is to align the number of aircraft operations with airport capacity,"[418] it could apply to programs with a different intent or effect. If ANCA does apply, airport proprietors will be subject to FAA's rigorous process for approving of operational procedures under 40 C.F.R. 161 (referred to as the Part 161 process) or its expansive reading of the limits on the conditions that may be imposed on aircraft operations, routes, and services. Even if ANCA does not apply, FAA (or an airport user) may argue that a particular measure was an unreasonable restriction on airport access.[419]

4. Support Modernization of Air Traffic Management (ACRP 56 AF-12)

Modernizing the air traffic control system by using satellite-based navigation and other technology has the potential to reduce in-flight GHG emissions by between 10 and 15 percent.[420] Satellite technology can allow airline pilots to fly more precise paths into airports using reduced thrust. Features such as Optimized Descent Profile (also known as Continuous Descent Approach),[421] area navigation (RNAV), more direct routings, and reduced delays have the potential to decrease aircraft fuel use and, therefore, emissions.[422] As an example, United Parcel Service aircraft equipped with Automatic Dependent Surveillance-Broadcast technologies have reduced some emissions by as much as 34 percent.[423]

FAA, aircraft owners, and other federal agencies are working to deploy some of these advanced navigation technologies and improvements through the NextGen program. While airports cannot require improved air traffic management measures on their own due to federal preemption of the field,[424] they are critical stakeholders that can promote and facilitate airspace improvements.

5. Support Reduced Engine Taxiing (ACRP 56 AF-14)

Reducing the number of engines for aircraft taxiing or idling on the ground can also save fuel, because the operation of multiple turbine engines at low power settings can waste fuel and generate emissions. Thus, both airports and airlines have promoted efforts to initiate single-engine or (for aircraft with more than two engines) reduced-engine taxiing. A number of airlines, including Virgin America, United Airlines, and American Airlines, report voluntary use of single-engine taxiing.[425] Aside from the emissions benefits of the practice, single-engine taxiing can benefit aircraft operators financially. A 2005 study by the International Air Transport Association found one-engine-off taxi-in operations can reduce ground fuel burn by 20 to 40 percent, depending on equipment.[426] American Airlines saves $10 million to $12 million a year as a result of this practice.[427]

Two-engines-off taxiing can also provide significant emissions-reduction opportunities. The 2005 International Air Transport Association study compared single-engine-off with two-engines-off taxiing operations for three types of aircraft engines, and it found that the fuel burn savings of two-engines-off operations were approximately two times greater.[428]

According to the GAO Report, 11 of 141 respondent airports indicated that they had adopted a single-engine taxiing policy.[429] However, single-engine taxiing may

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[416] Reimer & Putnam, *supra* note 26, at 89. *See* § III.A.

[417] *See* § III.B.

[418] 14 C.F.R § 161.5.

[419] *See* § III.E.2.

[420] Air Transport Association (ATA), Air Traffic Control Modernization and the Environment, http://www.airlines.org/Pages/Air-Traffic-Control-Modernization-and-The-Environment.aspx.

[421] Continuous Descent Approach, in which an aircraft lands by descending at a constant 3-degree angle rather than descending and holding at a series of altitude "steps," lowers fuel use and emissions by shortening flight time and eliminates the need for engine thrust required in a stepped approach to landing. Civil Air Navigation Services Organisation, Descent and Approach: Continuous Descent Approach, http://www.www.canso.org/CMS/showpage.aspx?id=355 (last visited June 12, 2012).

[422] *Id*.

[423] *See* Federal Aviation Administration, Fact Sheet: Next Generation Air Transportation System 2006 Progress Report (2007), http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=8336 (last visited June 12, 2012).

[424] *See* § III.B.

[425] *See, e.g.*, Virgin America, Virgin America Goes Green (Nov. 18, 2010), http://www.virginamerica.com/press-release/2010/Virgin-America-Grows-Green.html; UNITED AIRLINES, 2009–2010 CORPORATE RESPONSIBILITY REPORT 8 (2010), *available for download at* http://www.united.com/web/en-US/content/company/globalcitizenship/sustainabilty.aspx; Frontier Airlines, Annual Report (Form 10-K) 24 (May 26, 2009) http://msnmoney.brand.edgar-online.com/EFX_dll/EDGARpro.dll?FetchFilingHTML1?ID=6626121&SessionID=GKeKWZn2t35_P49; Press Release, American Airlines, Fuel Smart Overview, http://www.aa.com/i18n/amrcorp/newsroom/fuel-smart.jsp.

[426] SUSTAINABLE AVIATION, AIRCRAFT ON THE GROUND CO_2 REDUCTION PROGRAMME 8 (2010), *available at* http://www.sustainableaviation.co.uk/pages/news/aircraft-on-the-ground-co2-reduction-programme-best-practice-guidance-published.html.

[427] American Transport Association, Coping with Sky-High Jet Fuel Prices 29 (2008), *available at* http://cdm.fly.faa.gov/Workgroups/fuel/ATA%20Fuel%20Briefing.ppt (last visited Jan. 20, 2011).

[428] SUSTAINABLE AVIATION, AIRCRAFT ON THE GROUND CO_2 REDUCTION PROGRAMME 8 (2010), *available at* http://www.sustainableaviation.co.uk/pages/news/aircraft-on-the-ground-co2-reduction-programme-best-practice-guidance-published.html.

[429] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 41.

not be appropriate for all planes and under all circumstances. For example, some aircraft lack the ability to taxi on one engine.[430] Operational conditions, such as inclement weather, may also affect the ability of pilots to taxi on one engine.[431] Aircraft manufacturers often provide detailed aircraft-specific training addressing the appropriateness of the technique for particular technologies.[432]

Turning multiple engines off for taxiing can require an external towing source to move the aircraft. Between February and August 2010, Denver International Airport partnered with United Airlines to test a prototype tractor, which it used to tow more than 540 aircraft in the same period.[433] According to United Airlines, this saved the use of approximately 21,600 gallons of jet fuel.[434] CO_2 reductions were estimated at approximately 180 to 200 metric tons.[435]

Legal problems are unlikely to arise for airports that simply *support* reduced-engine taxiing through, for example, coordination with airlines and establishing nonmandatory policies. However, the idea of *mandating* engine-off taxiing has drawn criticism related to reducing pilots' flexibility, operational control, and safety. For example, the International Federation for Air Line Pilots' Associations firmly opposes any mandatory engine-off taxiing procedures.[436] An airport action to mandate such procedures would raise questions based on federal preemption of control over flight operations. Because requirements for taxiing deal directly with the movement of aircraft, they may be, therefore, preempted by federal aviation law.[437]

6. Support Use of Alternative Fuels in Aircraft Through Development or Facilitation of Fuel Supply

One of the most important long-term initiatives to reduce GHG emissions from aviation is to replace traditional petroleum fuels with biofuels or other lower-carbon fuels. Modern passenger and cargo aircraft generally use petroleum-based "Jet A" fuel.[438] The Air Transport Association of America estimates that each gallon of burned jet fuel produces approximately 3.1 gallons of CO_2.[439] While average fuel efficiency has improved 110 percent since the late 1970s, avoiding billions of metric tons of CO_2 emissions, the increase in aviation activity has caused total emissions to increase.[440]

Accordingly, the aviation industry has looked to changes in fuel as a means to reduce GHG emissions from aviation. In particular, biofuels have great promise to reduce net GHG emissions. Plant-based feedstocks (i.e., the source of the fuel, like oilseeds or algae) remove carbon from the atmosphere when they are grown and, thus, may reduce the net GHG impact of combustion of fuels. [441]

The FAA, Airports Council International–North America, Air Transport Association of America, and the Aerospace Industries Association sponsor the Commercial Aviation Alternative Fuels Initiative, which seeks to enhance energy security and environmental sustainability through alternative jet fuels for aviation. In 2009, the Initiative gained approval from ATSM International (the international standards organization that sets specifications for jet fuel) of a 50 percent synthetic fuel.[442] Fifteen airlines have announced prepurchase agreements with two alternative fuel suppliers,[443] and the Initiative is working to obtain approval of bio-jet

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[430] David Holzman, *Focus: Plane Pollution,* 105 ENVTL. HEALTH PERSPECTIVES 12 (1997), *available at* http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.971051300 (last visited June 14, 2012).

[431] John Cox, *Ask the Captain: How Pilots Stretch Their Fuel*, USA TODAY, Jan. 17, 2011, *available at* http://www.usatoday.com/travel/experts/cox/2011-01-17-fuel_N.htm (last visited June 14, 2012).

[432] Douglas Page, *Engine-Off Taxiing Picks Up Speed*, AVIATION TODAY, Oct. 22, 2009, *available at* http://www.aviationtoday.com/regions/usa/Engine-off-taxiing-picks-up-speed_36060.html (last visited June 14, 2012).

[433] UNITED AIRLINES, 2009–2010 CORPORATE RESPONSIBILITY REPORT 22 (2010), *available for download at* http://www.united.com/web/en-US/content/company/globalcitizenship/sustainabilty.aspx.

[434] *Id.*

[435] Reductions do not account for energy use by the tractor. The range reflects potential variations in fuel type (Avgas versus Jet A fuel). Calculation based on emissions factors taken from AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, REPORT 11, GUIDEBOOK ON PREPARING AIRPORT GREENHOUSE GAS EMISSIONS INVENTORIES 21 (2009), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf.

[436] Page, *supra* note 432.

[437] *See* § III.B.

[438] Air Transport Association, Alternative Aviation Fuels Q & A, http://www.airlines.org/Pages/Alternative-Aviation-Fuels-QA---Enviro.aspx (last visited June 14, 2012).

[439] Dana Hull, *A Push to Make Air Travel More Environmentally Friendly*, SAN JOSE MERCURY NEWS, Dec. 14, 2010, http://odewire.com/10256/a-push-to-make-air-travel-more-environmentally-friendly.html.

[440] Air Transport Association, ATA Releases 2010 Economic Report (Aug. 19, 2010), http://www.prnewswire.com/news-releases/101097999.html (last visited June 14, 2012); FEDERAL AVIATION ADMINISTRATION, AVIATION AND EMISSIONS: A PRIMER 10 (2005), http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/aeprimer.pdf.

[441] Air Transport Association, Alternative Aviation Fuels Q & A, http://www.airlines.org/Pages/Alternative-Aviation-Fuels-QA---Enviro.aspx (last visited June 14, 2012).

[442] Air Transport Association, Air Traffic Control Modernization and the Environment, http://www.airlines.org/Pages/Air-Traffic-Control-Modernization-and-The-Environment.aspx (last visited June 14, 2012).

[443] Commercial Aviation Alternative Fuels Initiative, Supporting Solutions for Secure and Sustainable Aviation (2010), *available at* http://www.caafi.org/about/pdf/CAAFI_brochure_August_2010.pdf (last visited June 15, 2012).

blends and fuels. [444] In 2011, ASTM approved a standard for the use of jet fuel containing 50 percent bio-derived synthetic fuel.[445]

Individual airports are also paying increased attention to aircraft fuels. The State of Washington's Department of Natural Resources recently announced a proposed pilot project to produce jet fuel from forest biomass.[446] This initiative arose out of the Sustainable Aviation Fuels Northwest Network, a consortium comprised of diverse business and government interests such as Boeing, the Port of Seattle (proprietor of Seattle–Tacoma), and the Washington State Commerce Department.[447] Airports can play a critical role in facilitating fueling infrastructure and may play a larger role, depending on the location of the fuel-producing facilities.

While airports may find it worthwhile to take on a supporting role for the development of alternative aircraft fuels, it will need to address additional legal issues if it takes more extensive steps. At one extreme, any efforts to mandate the use of a certain type of aircraft fuel are likely to face substantial legal challenges, especially based on federal preemption of control over flight operations, discussed in Section III.B. The jet fuel used by aircraft goes directly to issues of safety and other issues of control over flight operations. As such, any attempts by airports to regulate in this space are likely to be preempted.

However, there are other ways in which airports might encourage the development of alternative aircraft fuels. For example, airports may wish to locate bio-jet generation facilities on or near airport property. While such projects might facilitate greater use of such fuels through greater availability and more efficient delivery to sites where aircraft are located, they would also implicate a host of land use and environmental issues, such as those discussed in Section III.I and III.J. Large projects located near an airport, such as oilseed crushers or a biorefinery, would need to meet local land use and zoning restrictions. Additionally, concerns about pollution or wildlife attraction might be obstacles to obtaining NEPA and state environmental review approvals.

[444] Air Transport Association, Air Traffic Control Modernization and the Environment, http://www.airlines.org/Pages/Air-Traffic-Control-Modernization-and-The-Environment.aspx (last visited June 15, 2012).

[445] Cicely Enright, *Aviation Fuel Standard Takes Flight*, ASTM INTERNATIONAL STANDARDIZATION NEWS, Sept./Oct. 2011, http://www.astm.org/SNEWS/SO_2011/enright_so11.html.

[446] Washington State Department of Natural Resources, Forest Biomass Initiative to Take Next Step: Aviation Biofuel (2011), http://www.dnr.wa.gov/BusinessPermits/News/Pages/2011_01_11_biomass_nr.aspx (last visited June 15, 2012).

[447] *Id.*; *see also* Sustainable Aviation Fuels Northwest Network, Powering the Next Generation of Flight 83 (2011), *available at* http://www.safnw.com/wp-content/uploads/2011//06/SAFN_2011Report.pdf.

B. Business Planning

Business planning efforts relate to master planning, operational planning, and similar initiatives that guide airport development and activities. Inclusion of GHG considerations in these planning efforts can help reduce GHG emissions at airports.[448]

A number of partnerships or airports have developed sustainable planning, design, or construction guidelines or plans in recent years. Two examples of major initiatives include Los Angeles World Airports' Sustainability Plan and the City of Chicago's Sustainable Design Manual for the O'Hare Modernization Program.[449] Fifty-three of 141 airports surveyed in the GAO Report indicated that they followed some standard for environmental sustainability.[450] These efforts generally identify addressing GHG emissions as one of the elements of sustainability.

1. Use Airport-Specific Sustainable Planning, Design, and Construction Guidelines, and Set a Policy for Green Building Certification of Buildings (ACRP 56 BP-08, BP-10)

Two sustainable building strategies were identified in ACRP 56's top 10 measures for reducing GHG emissions. Embedded in these strategies is the green building certification program established by the U.S. Green Building Council: Leadership in Energy and Environmental Design (LEED). This standard uses a point system to assess the sustainability of facility design, construction, and operations. Many LEED measures can reduce GHGs. It also provides third-party certification that certain sustainability levels (silver, gold, and platinum) have been met.

Fifty-four of 141 airports surveyed in the GAO Report reported following LEED's rating system.[451] Twelve airports indicated that their airport has a LEED-certified building.[452] For example, 1) Boston's Logan Airport's Terminal A was the first in the world to receive LEED certification;[453] 2) the City of Santa Monica

[448] Note that there is overlap between this category and most of the other categories of airport practices that reduce emissions. An emissions reduction measure could be identified in a business planning exercise and then implemented through a construction project, operations practice, or ground transportation improvement.

[449] Los Angeles World Airports, Sustainability Plan (2008), *available at* http://www.lawa.org/uploadedFiles/LAWA/pdf/Sustainability%20Plan%20(Final).pdf; City of Chicago, O'Hare Modernization Program Sustainable Design Manual (2003), *available at* http://www.acec.org/advocacy/committees/pdf/eec0808_omp_manual.pdf.

[450] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 64 (2010), *available at* http://www.gao.gov/special.pubs/gao-10-748sp/.

[451] *Id.* at Q 44 (2010).

[452] *Id.*

[453] Massport, Massport Achievements: Recognized as an Environmental Leader, *available at* http://www.massport.com

recently built a LEED Gold–certified rental car facility at the Santa Monica Airport;[454] 3) Los Angeles International Airport was awarded LEED Silver certification for the renovation of the Tom Bradley International Terminal;[455] and 4) Oakland International's Terminal 2 extension and renovation was awarded LEED Silver certification in 2010.[456] Additionally, 29 of 141 respondents to the GAO Report's survey have at least one building constructed in accordance with LEED standards, and 55 airports indicated that they were planning to construct a building or buildings in accordance with LEED standards.[457] There is a difference between the airports that have actually received LEED certification and the airports that have followed LEED guidelines; certification requires third-party verification and somewhat greater cost. Thirty-four respondent airports indicated that they are subject to state or local requirements that public buildings become "green" or environmentally sustainable.[458]

Some airports have also worked to create airport-specific sustainable planning processes that more completely and better address the unique nature of airport environments. For example, the City of Chicago produced a sustainable design manual as part of the O'Hare Modernization Program.[459] The *Sustainable Design Manual* is inspired by LEED guidelines and identifies where airports could obtain LEED points for sustainable actions.[460] The manual addressed a wide range of sustainability issues, including energy efficiency. In 2011, the City of Chicago released an updated *Sustainable Airport Manual* that refreshes the *Sustainable Design Manual*'s design and construction guidelines and also addresses sustainable airport planning, operations and maintenance, and concessions and tenants.[461]

A number of the strategies outlined in the O'Hare *Sustainable Design Manual* and *Sustainable Airport Manual* could reduce an airport's GHG emissions:

- Locating projects within a half-mile of an existing or planned rail link or within a quarter-mile of two or more bus lines.
- Providing employees incentives to use public transportation.
- Providing bicycle access, storage, and changing rooms for building users.
- Installing fueling stations for alternative-fueled vehicles.
- Meeting minimum levels of energy efficiency.
- Optimizing energy performance above minimum levels of efficiency, including through the use of light-emitting diode (LED) lighting on the airfield.
- Using alternative refrigerants to chlorofluorocarbons, hydrochlorofluorocarbons, and hydrofluorocarbons based on their global warming potential.
- Generating or procuring green power.
- Using clean-fuel construction vehicles with pollution-control technology or low-emission construction vehicles.[462]

Projects to reduce the GHG emissions associated with construction at airports are likely to have both physical and financial impacts. To the extent that capital projects incur additional costs specifically for GHG-mitigation efforts, airports may be asked to justify these incremental costs under revenue diversion and self-sustaining airport principles. A recent study of LEED certification indicates that it adds 4 to 11 percent of a project's construction costs.[463] This could be as much as $80 million to $220 million on a $2 billion project. Some of these costs are "soft costs," such as verification of compliance with LEED requirements through certification, and do not directly result in environmental, cost, or passenger-experience improvements at the airport.

As with any environmental planning or design costs, airports seeking to pass these environmental costs onto aeronautical users would need to demonstrate they were reasonable.[464] Highlighting co-benefits of such projects—e.g., energy savings, reductions in criteria air pollutants, improvement in employee or passenger health and experience, etc.—may help airports to make this case. Further, FAA grant assurances do not require the cheapest possible improvement on the airport. Airports have traditionally had discretion to build more comfortable, more attractive, or more flexible facilities, so long as costs are not grossly disproportionate. Much

/environment/pages/massportachievements.aspx (last visited June 15, 2012).

[454] Santa Barbara Airport, LEED Gold at Santa Barbara Airport QTA, *available at* http://www.flysba.com/news_facts/news/leed_gold_at_santa_barbara_airport_qta (last visited June 15, 2012).

[455] Los Angeles World Airports, Articles About LAX Development Program, *available at* http://www.lawa.org/laxdev/dispLAXDev.aspx?id=3767 (last visited June 15, 2012).

[456] Port of Oakland, Oakland International Airport's Terminal 2 Awarded Prestigious LEED® Green Building Silver Certification (Mar. 17, 2010), *available at* http://www.flyoakland.com/press_releases_detail.aspx?ID=581&t=p (last visited Jan. 24, 2011).

[457] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 65.

[458] *Id.* at Q 72.

[459] CITY OF CHICAGO, SUSTAINABLE DESIGN MANUAL (2003), *available at* http://www.acec.org/advocacy/committees/pdf/eec0808_omp_manual.pdf (last visited Jan. 24, 2011).

[460] *Id*. at 9.

[461] CHICAGO DEPARTMENT OF AVIATION, SUSTAINABLE AIRPORT MANUAL (2011), *available at* http://airportsgoinggreen.com/Content/Documents/CDA-SAM-v2.1-Octobe-31-2011-FINAL.pdf.

[462] *Id.*

[463] NORTHBRIDGE ENVIRONMENTAL MANAGEMENT CONSULTANTS, ANALYZING THE COST OF OBTAINING LEED CERTIFICATION 2 (2003), *available at* http://www.cleanair-coolplanet.org/for_communities/LEED_links/AnalyzingtheCostofLEED.pdf.

[464] *See* discussion of federal restrictions on rates, charges, and use of airport revenue at § C.

green construction can and should be analogized to these traditions and practices.

To the extent that these strategies require action on the part of airport tenants, airports may seek to require their implementation by these parties through minimum standards, lease agreements, use agreements, and other instruments.

2. Create a Carbon Offset Purchasing Strategy (ACRP BP-05)

Some airport authorities have investigated or initiated the purchase of carbon offsets for some portion of airport operations. The purchase of carbon offsets by airport authorities raises a number of legal questions, especially relating to the revenue diversion and self-sustaining airport grant assurances.[465] This is in large part because almost all offsets that could be purchased for emissions reductions occur off the airport and are not associated with aeronautical activity. The purchase of emissions offsets secured off-airport for traditional air pollutants (like ozone precursors) is permissible under general conformity or new source review permitting programs under the CAA when those offsets are mandated as part of regulatory compliance.[466]

Off-airport carbon offsets are more complicated to justify, in terms of revenue diversion and self-sustaining requirements, insofar as there are no current legal obligations for an airport to offset its GHG emissions from operations. Consider a scenario in which an airport chooses to offset its carbon emissions by retrofitting the school buses of the general-purpose municipality with expensive but low-emitting electric, natural gas, or hybrid buses. These school buses would serve typical municipal functions off airport property and are unlikely to ever be used at the airport. Airport transfers of revenues to a municipality for the purchase of school buses, absent justification, would not be permitted under revenue-use principles. This raises the question of whether GHG considerations are sufficient justification for the revenue transfer.

If airport revenue is used for off-airport offset purchases, the sponsor would need to demonstrate that the carbon offset purchase serves aeronautical purposes, or is otherwise an appropriate exercise of its proprietary authority. This is the threshold question for airports seeking to use revenue to offset carbon emissions off the airport. There is no reliable guidance regarding whether off-airport expenditure of funds for offsets would be a permissible aeronautical expense in the absence of federal or other mandates. Where an airport is required to offset or otherwise reduce its emissions to meet regulatory requirements, for example, as mitigation for a development project under a state NEPA equivalent, off-airport offsets may be permissible.

The case to allow airports to offset their own carbon emissions on-airport may at first glance appear to be easier to make in that it raises fewer obvious revenue diversion considerations. But what if the costs of offsetting the airport's actual carbon emissions were much higher on a per-ton basis than the cost of purchasing off-airport offsets? Self-sustaining airport principles arguably encourage airports to pursue revenue maximization and cost savings. If much cheaper possible offsets were purchasing and preserving land containing tropical rainforests in an equatorial country, would this be preferable to airport or local offset investments? What weight is to be accorded to the proximity of offsets to their source?

These presently unanswered questions highlight important considerations for airport sponsors considering offset purchases, but there is little guidance at this time. Until this uncertainty is resolved, perhaps as mitigation and offset programs mature, airports may face less legal risk by focusing on direct reductions of emissions from sources within their scope of control.

The situation is different if nonairport revenue is used by a general purpose government, port authority, or other airport proprietor with access to nonairport revenues. For example, the Port Authority of New York and New Jersey has many nonaeronautical revenue sources such as user fees at bus terminals or tolls on its bridges and tunnels. Cross-subsidization of airport offsets would be permissible (from an aviation perspective) by such authorities.

3. Offer Voluntary Carbon Offsets for Passengers (ACRP 56 BP-07)

Another option airports have explored is to make it easier for passengers to offset the GHG impacts of their own travel at the airport or through airport Web sites. Two legal considerations are important to note here.

First, airport proprietors are barred from imposing mandatory charges on passengers to fund carbon offsets by the Anti-Head Tax Act of 1973.[467] However, airports may make off-airport credits available for voluntary purchase by travelers, just like flight insurance or other services. Such an approach would avoid potential Anti-Head Tax Act conflicts.[468]

Second, airports should consider federal airport-revenue use restrictions to the extent that airport funds are used to start or subsidize such programs. Sponsors should consider soliciting third parties to offer such services and collecting rent, sharing profit, or other considerations.

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[465] *See* § III.C.

[466] For more discussion of carbon offset markets, *see* ACRP Report 57, *The Carbon Market: A Primer for Airports*, *available at* http://www.trb.org/ACRP/Blurbs/166411.aspx.

[467] 49 U.S.C. § 40116(b)

([A] State or political subdivision of a State may not levy or collect a tax, fee, head charge, or other charge on—(1) an individual traveling in air commerce; (2) the transportation of an individual traveling in air commerce; (3) the sale of air transportation; or (4) the gross receipts from that air commerce or air transportation).

See § III.C.

[468] *See* ACRP, *supra* note 466.

One U.S. airport to provide on-airport opportunities for air travelers to voluntarily offset the carbon emissions created by their travel is San Francisco International Airport. A third party operates this system as a 2-year pilot program, which under San Francisco law does not require a competitive process for procuring services.[469] San Francisco International's Airport Commission authorized approximately $175,000 in initial capital support for the project.[470] The airport's funding contribution covered the cost of three kiosks, over which the airport retains ownership rights, that are reprogrammable to serve basic customer service functions if the offset program is discontinued.[471] The airport also allocated some funding for advertising the kiosks.[472]

The third-party operator provides services to the airport at no cost to the airport, which includes buying and making available verified carbon offsets for purchase by the traveling public, as well as the generation of reports for the airport.[473] Monies raised through the kiosks are treated in a manner analogous to concessions revenue.[474] Accordingly, offset projects are left primarily to the discretion of the third-party operator, 3Degrees, with the caveat that $1.50 per ton of offset sales is directed towards the SFCarbonFund, a City-run fund that invests in GHG-reduction projects within San Francisco.[475] Under the pilot program agreement, San Francisco International was to receive a portion of the profit from kiosk operations when a certain threshold had been reached.[476]

Other airports have also made efforts to allow their passengers to offset their carbon impacts. Santa Monica Airport offers airport users a carbon calculator and links for carbon offset purchases on the airport's Web site.[477] The Port Authority of New York and New Jersey also offers a carbon calculator on its Web site.[478] In 2008, Denver International Airport issued a request for proposals (RFP) for a concessionaire to run a voluntary travel carbon offset program.[479] However, the RFP did not generate much interest, and the airport did not accept any bids.[480]

4. Develop an Airport Expansion and Development GHG Emission Policy (ACRP 56 BP-02)

Airport development plans can have positive or negative effects on GHG emissions, depending on the project. At the very least, airport development creates an opportunity to assess and address GHG emissions. Consideration of GHGs in expansion and development plans can help airports identify the impacts of growth, as well as find opportunities to reduce emissions from the outset of expansion or development projects. As discussed in Section III.J, incorporating climate change considerations into expansion and development plans is also increasingly necessary to help meet regulatory requirements under the NEPA and state equivalents.

5. Develop and Maintain Environmental Management Systems

Thirty-four of the 141 GAO Report's survey respondent airports currently have an Environmental Management System, and 34 more airports plan to have one in the future.[481] An Environmental Management System seeks to integrate environmental considerations in the management of an airport and involves a continuous process of environmental improvement at a facility. It often includes GHGs and energy efficiency as criteria for management. Airports usually follow one of two standards—the International Organization for Standardization Standard 14001 (10 airports) and EPA's compliance-focused Environmental Management System (7 airports).[482] Eight airports reported that their systems cover all operations, while 12 airports indicated that their systems cover only some.[483]

The FAA has also recently developed a pilot program to encourage airports to incorporate sustainability efforts into the development of airport management or master planning. FAA's Airports Office "envisions sustainability becoming a core planning objective, not a

[469] Telephone Interview with Melba Yee, Deputy City Attorney, San Francisco City Attorney's Office (Jan. 11, 2011).

[470] San Francisco Airport Commission, Minutes of the Airport Commission Meeting of Nov. 18, 2008, at 6 (statement of John L. Martin), *available at* http://www.flysfo.com/web/export/sites/default/download/about/commission/agenda/pdf/minutes/m111808.pdf.

[471] *Id.*

[472] *Id.*

[473] Email correspondence with Melba Yee, Deputy City Attorney, San Francisco City Attorney's Office (Jan. 26, 2011).

[474] Telephone Interview with Melba Yee, Deputy City Attorney, San Francisco City Attorney's Office (Jan. 11, 2011).

[475] 3Degrees, Good To Go Green: SFO Unveils Carbon Offset Kiosks, powered by 3Degrees, http://www.3degreesinc.com/news/good-go-green-sfo-unveils-carbon-offset-kiosks-powered-3degrees (last visited June 15, 2012).

[476] Telephone Interview with Melba Yee, Deputy City Attorney, San Francisco City Attorney's Office (Jan. 11, 2011).

[477] Santa Monica Municipal Airport, Carbon Offset http://www.smgov.net/Departments/Airport/Right_side_tabs/Carbon_Offset.aspx (last visited June 12, 2012).

[478] PANYNJ, Carbon Calculator, http://www.panynj.gov/about/carbon-calculator.html (last visited June 12, 2012).

[479] City and County of Denver Department of Aviation, Request for Proposals: Consumer Service Concession Voluntary Travel Carbon Offset Program (Jan. 14, 2008), *available at* http://www.responsiblepurchasing.org/purchasing_guides/carbon_offsets/specs/ColoradoAirport_CarbonOffsetsRFP_2008.pdf.

[480] *Denver International Carbon Offset Program Fails to Take Off*, ENVIRONMENTAL LEADER, June 30, 2008, http://www.environmentalleader.com/2008/06/30/denver-international-carbon-offset-program-fails-to-take-off/ (last visited June 15, 2012).

[481] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 61.

[482] *Id.* at Q 62.

[483] *Id.* at Q 63.

secondary activity."[484] FAA's pilot program offers 10 airports AIP funding to incorporate sustainability as a core objective in long-range planning documents. Some airports will update their entire master plan, while others will develop stand-alone Sustainable Management Plan documents.[485] FAA's interim guidance on the pilot program notes that reduced carbon footprints are one of the many benefits of airport sustainability planning.[486]

C. Construction

The process of construction involves the emission of GHGs through operating construction equipment, hauling materials, and handling of construction and demolition waste. Of 141 airports responding to the GAO Report's survey, 129 indicated that they had undertaken capital development in the past 5 years.[487] Additionally, 113 said that they would undertake such a project in the next 5 years; 20 more will consider undertaking capital developments in the next 5 years.[488]

ACRP has recently released Report 42, *Sustainable Airport Construction Practices*, which considers a range of sustainable practices, some of which can reduce the GHG effects on construction at airports.[489] Readers are encouraged to consult this resource for additional information regarding sustainable practices for airport construction. A few illustrative reduced-GHG construction practices that airports could potentially employ are discussed below. Airports can seek to implement these and other practices through allowances, provisions, or specifications in leases, minimum standards, and construction contracts.

1. Use Warm-Mix Asphalt in Place of Hot-Mix Asphalt (ACRP 56 CN-01)

Asphalt is frequently used for road surfaces, taxiways, ramps, and runways at airports. Asphalt runways can be found at a number of the nation's airports, including Baltimore-Washington International, Lindbergh Field in San Diego, McCarran International, Memphis International, Newark Liberty International, Oakland International, Chicago O'Hare International, and San Francisco International.[490]

Asphalt pavement materials are made by heating asphalt and mixing it with aggregate materials such as sand, stone, and gravel. Traditionally, asphalt is heated to well over 300 °F to decrease its viscosity and facilitate mixing. This heating process creates GHGs. An emerging asphalt preparation, known as warm-mix asphalt, has been shown to reduce GHG emissions associated with asphalt production by reducing the temperature to which it is heated.

FAA's grant assurances and extensive safety standards for pavement used at airports are designed to ensure that airports maintain the value of pavement investments over their useful life. Airports seeking to use warm-mix asphalt rather than hot-mix asphalt will have to ensure that their projects meet the rigorous construction and pavement design requirements established by FAA.[491] If the warm-mix asphalt were less durable, such that it could not last for a period comparable to normal asphalts, this would raise significant questions under Assurance 19.[492] Similarly, if warm-mix asphalt would become too soft in high-heat conditions, leading to pavement or aircraft damage, there would be similar questions. Warm-mix asphalt specifications and technology are likely to continue improving and evolving, so airports should carefully evaluate the durability of the pavement in their specific application.

A recent runway project at Boston Logan Airport used warm-mix asphalt to reduce CO_2 emissions by nearly 4,000 tons, equivalent to about 400,000 gallons of diesel fuel savings.[493] This was the first airport warm-mix asphalt project nationwide; it decreased energy consumption while also allowing the use of more recycled asphalt pavement in the final product.[494] FAA oversight of warm-mix asphalt testing on a taxiway and apron areas was required before Boston Logan Airport

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[484] Patrick Magnotta, FAA Office of Airport Planning and Programming, National Planning and Environmental Division, *FAA's Sustainable Master Plan Pilot Program* 5, Presentation to Airports Going Green Conference, Chicago, Ill., Nov. 15, 2010, *available at* http://www.airportsgoinggreen.org/Content/Documents/Patrick%20Magnotta.pdf (last visited June 12, 2012).

[485] Memorandum from Elliot Black, Acting Director, FAA Office of Planning and Programming, to Regional Airports Division Managers, at 2, May 27, 2010, *available at* http://www.faa.gov/airports/environmental/sustainability/media/interim_guidance_sustainable_master_plan_pilot.pdf (last visited June 15, 2012).

[486] *Id.*

[487] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 90.

[488] *Id.* at Q 96.

[489] AIRPORT COOPERATIVE RESEARCH, TRANSPORTATION RESEARCH BOARD, REPORT 42, SUSTAINABLE AIRPORT CONSTRUCTION PRACTICES (2011), https://www.transportationresearch.gov/dotrc/infrastructureandmaterials/Shared%20Documents/ACRP%2042%20-%20Sustainable%20Airport%20Construction%20Practices.pdf.

[490] Missouri Asphalt Pavement Alliance, Asphalt for Airports: Questions and Answers, http://www.moasphalt.org/facts/asphalt/airport_qa.pdf (last visited Jan. 26, 2011).

[491] These standards can be found in AC 150/5370-10, Standards for Specifying Construction of Airports, http://www.faa.gov/airports/engineering/construction_standards/, and AC 150/5320-6E, Airport Pavement Design and Evaluations, http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/99762, FEDERAL AVIATION ADMINISTRATION, *Standards for Specifying Construction of Airports*, ADVISORY CIRCULAR 150/5370-10F (2011), http://www.faa.gov/airports/resources/advisory__circulars/index.cfm/go/document.current/documentNumber/150_5370-10.

[492] *See* § III.F.

[493] Massport, Boston Logan Is the First Airport in the Nation to Use "Green" Asphalt on Runway (Sept. 19, 2009), *available at* http://www.massport.com/news-room/News/GreenAsphaltRunway.aspx (last visited June 15, 2012).

[494] *Id.*

was allowed to use warm-mix asphalt on the runway.[495] Warm-mix asphalt was used on the outer 37.5 ft of the edges of Runway 22L in 2008.[496]

According to the project contractor for Logan Airport, Aggregate Industries, performance-based contracts were used to address criteria such as air voids, stability, compaction, and grade standards. "Performance-based specifications on this job allow[ed] the contractor to offset any penalties with bonuses achieved in meeting the outlined requirements monitored by quality control and the Massport consultants."[497] The contractor was able to receive 100 percent payment under the FAA specification.[498] If the project meets long-term performance requirements, Boston Logan hopes to use warm-mix asphalt rather than hot-mix asphalt in all future runway projects at the airport.[499]

At least one airport has chosen not to use warm-mix asphalt due to concerns about the lifespan and durability of the pavement: the City of Phoenix Aviation Department has determined that warm-mix asphalt can melt when exposed to the high temperatures experienced at that airport.[500]

2. Implement a Construction Vehicle Idling Plan, and Specify Low-Emissions Construction Vehicles and Equipment (ACRP 56 CN-03, CN-04)

Airports may also adopt practices to reduce idling of construction vehicles and equipment.[501] Anti-idling technology, signage, and promotional materials are among the strategies that have been considered by or adopted at U.S. airports, including Denver International Airport.[502] Reductions in idling can reduce emissions of both GHGs and traditional local air pollutants. ACRP 56 identified the implementation of a construction vehicle-idling plan as one of the top 10 measures for reducing GHG emissions.

A number of airports have also required that construction equipment used on airport projects meet emissions-related or fuel-efficiency requirements, including alternative fuel use, retrofit of older equipment, or purchase of newer units. While these requirements are typically targeted towards reductions of particulates and other traditional air pollutants, they could also reduce GHGs in some circumstances.[503] Until 2004, EPA's emissions standards for construction equipment were not very stringent, allowing for substantial air pollution.[504] In 2004, EPA announced standards for new nonroad diesel engines, but many older engines have long lifespans and are still in use at construction sites around the nation.[505]

Airports seeking to reduce emissions from older construction equipment in operation at their sites can ask contractors, through contract specifications, to clean up or replace older engines.[506] Since 2004, Los Angeles World Airports has committed to requiring contractors to retrofit older nonroad engines used on the property for more than 20 days per calendar year with "best available emissions control devices."[507] Other airports, such as Chicago O'Hare, have adopted similar standards.[508]

Airports have also considered and used contract preferencing, which encourages (but does not require) contractors to commit to emissions-reduction strategies during construction. Airports could also select the lowest-cost bidder but allow an additional contract allowance to fund diesel cleanup. The City of Atlanta set aside a diesel retrofit allowance for the winning bidder of a contract to construct a fifth runway at the airport in 2006.[509] While technological constraints prevented the contractor from using retrofit technologies with the equipment in question, similar contract allowance programs have been successfully applied in other contexts.[510]

Because airports have the power to regulate many terms under which contractors may operate, the im-

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[495] Massport, Boston Logan Is the First Airport to Use a Green Asphalt Runway: Warm Mix Asphalt Repaving to be Completed This Weekend (Sept. 19, 2009), http://www.massport.com/news-room/News/GreenAsphaltRunway.aspx (last visited June 15, 2012).

[496] *Id.*

[497] Greg Udelhofen, *Boston Logan's Warm Mix*, AIRPORT BUSINESS, *available at* http://www.airportbusiness.com/publication/article.jsp?pubId=1&id=26379&pageNum= 1 (last visited June 12, 2012).

[498] *Id.*

[499] *Id.*

[500] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 489, at 19.

[501] JANEA SCOTT ET AL., ENVIRONMENTAL DEFENSE FUND, CLEANER DIESEL HANDBOOK 44–50 (2005) (includes some examples of anti-idling contract language), http://www.edf.org/sites/default/files/4941_cleanerdieselhandbook.pdf.

[502] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 489, at A-43 to A-44.

[503] For example, pollution filters targeting black carbon may provide net climate change benefits. MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION, RETROFITTING EMISSION CONTROLS FOR DIESEL-POWERED VEHICLES 3 (2009), *available at* http://www.meca.org/galleries/default-file/MECA%20diesel%20retrofit%20white%20paper%201009.pdf.

[504] SCOTT ET AL., *supra* note 501, at v.

[505] *Id.*

[506] *Id.* at 44–50 (2005).

[507] LAX Master Plan Program, Community Benefits Agreement, § X.F (2004), *available at* http://www.ourlax.org/commBenefits/pdf/LAX_CBA_Final.pdf (last visited June 15, 2012).

[508] Michelle Cecchin et al., *Green Construction Practices and Tracking* 7–19, Presentation at Airports Going Green Conference, Chicago, Ill. (Aug. 2009), *available at* http://www.airportsgoinggreen.org/Content/Documents/OMP%20Case%20Study%20Green%20Construction%20Practices%20and%20Tracking.pdf (last visited June 15, 2012).

[509] ICF CONSULTING, EMISSION REDUCTION INCENTIVES FOR OFF-ROAD DIESEL EQUIPMENT 67–68 (2005), *available at* http://www.northeastdiesel.org/pdf/EmissionReductionIncentivesICF.pdf.

[510] *Id.* at 67–69.

plementation of this measure is unlikely to have any major legal implications. However, sponsors should always keep in mind basic contractual issues that may arise with trying to change terms of existing agreements.

In contrast, the ability of state and local governments, including airports, to require private contractors to use low-emitting construction equipment under the police power would likely be preempted under the CAA, as discussed in Section III.A. However, as also discussed in that section, airports may act as market participants even without direct acquisition of clean construction equipment through the use of contract specifications that commit third-party contractors working on airport projects to the use of low-emitting vehicles. Some state governments require the use of green equipment specifications for all government-funded construction contracting.[511]

3. Recycle and Reuse Construction and Demolition Materials (ACRP 56 CN-02)

Recycling or reusing construction and demolition materials can reduce life-cycle emissions by displacing the energy needed to develop new construction materials. Airports can promote the recycling and reuse of construction and demolition materials in a variety of ways, including:

- Requiring contractors to develop a waste management plan that includes waste targets and proposed actions to reduce waste.
- Providing contractors with a list of local companies that reuse and recycle materials.
- Specifying minimum quantities of excess materials that will be accepted for return by a contractor in contracts.
- Requiring regular submission of site waste recycling reporting forms.
- Offering financial incentives to contractors that substantially exceed the requirements of a waste management plan.[512]

Approximately half of airports surveyed in the GAO Report (71 of 141) indicated that they recycled or reused building materials in construction.[513] Recycling may be prompted by the airport sponsor or may be required by state or local law. For example, the City of Chicago requires that construction projects permitted after 2007 recycle or reuse at least 50 percent of construction and demolition waste from individual project sites.[514] San Francisco International's Terminal 2 renovation program recycled 90 percent of construction and demolition debris, producing an estimated one-time reduction in CO_2 emissions of 12,300 tons.[515]

D. Carbon Sequestration

Most carbon-mitigation strategies discussed and implemented by airports focus on reducing the amount of carbon emitted. Another form of global-warming mitigation, carbon sequestration, focuses on taking CO_2 out of the atmosphere.

A number of potential carbon-sequestration technologies, such as soil storage or carbon-capture and storage processes, are still in the research and testing phases of development. As carbon-sequestration technologies approach market viability, they are likely to raise a host of regulatory issues that cannot be fully predicted at this time. Most sequestration projects are not likely to be practical in the airport setting due to the multiplicity of sources that are predominately mobile. Regardless of the specific sequestration method, some general legal issues may arise:

- Limitations concerning use of airport revenue and passing on environmental costs to airport users.[516]
- State or local land use laws affecting the types of carbon-sequestration measures airports can implement.[517]
- An evolving regulatory regime under both the Federal CAA and CWA, particularly for underground sequestration practices and projects.[518] EPA has become concerned about the air and groundwater impacts of some CO_2 injection systems, in particular.
- Prospective regulation regarding the quality and use of carbon credits.

Finally, carbon-sequestration projects frequently last for extensive periods of time. If airports were to sell carbon credits that entail an airport contractual commitment to sequester carbon for an extended time period—including decades long—there could be questions about whether the potential for large future liabilities

[511] Publicly owned nonroad vehicles or vehicles used on public construction contracts may also be subject to retrofit requirements in New Jersey, New York, and Cook County, Illinois. N.Y. COMP. CODES R. & REGS. tit. 6, § 248 (2006); 39 N.J. REG. 3352(a) (Sept. 8, 2007); COOK COUNTY, ILL., CODE § 30-950 et seq. (2010).

[512] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 489, at A-48 to A-50.

[513] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 70.

[514] CHICAGO, ILL., CODE § 11-4-1905 (2010).

[515] San Francisco International Airport, Terminal 2: Sustainability, http://www.flysfo.com/web/page/about/T2/sustainability/ (last visited June 15, 2012).

[516] *See* § III.C.

[517] *See* § III.I.

[518] EPA, *Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide; Final Rule*, 75 Fed. Reg. 75060 (Dec. 01, 2010) (to be codified at 40 C.F.R. Pts. 72, 78, and 98). Facilities that geologically sequester CO_2 may also be subject to the permitting requirements under Safe Drinking Water Act Underground Injection Control (UIC) regulations. EPA, *Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO_2) Geologic Sequestration (GS) Wells*, 75 Fed. Reg. 77230 (Dec. 10, 2010).

would cause concern under the preservation of rights and powers and self-sufficient airport grant assurances.[519] Similarly, airports would need to ensure that they meet long-term lease and fair-market-value requirements.

1. Install Sustainable, Long-Term Vegetation and Invest in Terrestrial Carbon Sinks (ACRP 56 CS-01, CS-04)

For airports, one of the more viable sequestration strategies is the use of vegetation to sequester carbon. Vegetation sequesters carbon by converting atmospheric CO_2 into organic matter. Planting or encouraging long-term vegetation (i.e., no or limited cutting or tillage) creates a terrestrial storage place for carbon. Airports can establish landscaping guidelines or policies that promote the use of sustainable, long-term vegetation rather than shorter-lived plants such as annuals. When well-maintained or undisturbed, some plants can serve as carbon sinks for as long as several centuries.[520]

As with off-airport carbon-offset purchases, off-airport sequestration projects could raise significant revenue diversion concerns. On-airport projects may raise a number of questions, as well. The two most likely on-airport sequestration approaches would involve dedicating property to forests or no-till agriculture or grasslands. If this could be done without significant airport cost, it may not raise revenue diversion concerns, especially if the costs were comparable to the management of property airports already undertake or if other benefits to the airports arise. However, if airports contractually bind themselves to maintain the forests or grasslands for long periods of time in exchange for payments, it would raise questions about self-sustaining airport principles.[521] A long-term agreement would probably require FAA approval as a property release, much like a long-term nonaeronautical lease. If grasslands or forest were required to remain in place for 20 to 30 years (typical for some carbon credits), the property could not be used for most aeronautical purposes. It could also not be used for many other types of nonaeronautical purposes. If these other uses could generate higher revenues, it raises questions about whether the airport is recovering fair market value for this property.

Further, if the airport were able to sell carbon credits in exchange for its sequestration efforts, the proceeds would be subject to revenue-diversion requirements.[522]

On-airport sequestration implicates other important federal limitations on airport authority as well. In particular, airports must ensure that such projects comply with the sponsor's grant obligations, including the obligations not to encumber its title or interest in property[523] and to avoid or mitigate hazards to air navigation at airports.[524] Trees near flight surfaces would require examination for potential flight risks, and any contracts relating to sequestration on airport property would probably need to contain provisions allowing the airport to cut vegetation that may pose a hazard to aviation. Further, airports will need to consider whether promotion or protection of certain types of forestry, agriculture, or grassland could cause or retain wildlife hazards inconsistent with Part 139 obligations or the grant assurances.

E. Energy Management

The use of electricity, gas, and other fuels contributes to GHG emissions whether the combustion occurs on or off the airport. Therefore, programs and projects to increase airport-related energy efficiency can reduce GHG emissions. Implementation of energy management measures may be particularly attractive to airports because of their effectiveness in reducing GHG emissions at relatively low cost. After personnel expenses, energy costs are often an airport's largest operating expense.[525] Unsurprisingly, all but five of the 141 airport respondents to the GAO Report's environmental survey reported the use of energy-conservation devices in their airports.[526]

Airports are likely to have direct control over much of the electricity and natural gas use at airports, particularly related to temperature control and lighting in terminal and other buildings. To the extent that tenants control their own energy use, airports may be able to encourage, incentivize, or require tenants to take measures to improve energy efficiency. Airports may be able to include energy-efficiency requirements in airport leases, contracts, minimum standards, and similar documents.

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[519] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Assurance 5–Preserving Rights and Powers; Assurance 24–Fee and Rental Structure; Assurance 31(c)–Disposal of Land), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf. *See* § III.C.4.

[520] Christer Jansson, Stan D. Wullsschleger, Udaya C. Kalluri, & Gerald A. Tuskan, *Phytosequestration: Carbon Biosequestration by Plants and the Prospects of Genetic Engineering*, 60 BIOSCIENCE 685, 687 (Oct. 2010).

[521] *See* § III.C.4.

[522] *See* § III.C.2.

[523] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Assurance 4–Good Title); *see also* 49 U.S.C. § 47106(b)(1), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[524] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Assurance 8–Consultation with Users), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf. *See* § III.F.

[525] AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, RESEARCH RESULTS DIGEST 2, MODEL FOR IMPROVING ENERGY USE IN U.S. AIRPORT FACILITIES 12 (2007), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rrd_002.pdf.

[526] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 68.

The green leasing provisions available in the following documents may offer helpful resources:

- General Service Administration's "Green Lease Policies and Procedures."[527]
- Building Owners and Managers Association's Guide to Writing a Commercial Lease.[528]
- Real Property Association of Canada's *National Standard Green Office Lease for Single-Building Projects*.[529]
- California Sustainability Alliance's "Green Leases Toolkit."[530]

The Minneapolis–St. Paul International Airport offers a recent example of an airport that is implementing extensive energy-management measures. In 2011, the airport finalized plans to undertake comprehensive energy conservation efforts.[531] The airport estimates savings of over $4 million per year from upgrades to its mechanical, electrical, plumbing, lighting, building envelope, and conveyance systems.[532]

1. Implement Energy Management Measures (ACRP 56 EM-08, EM-06, EM-18, EM-31, EM-38, EM-39, EM-37, EM-10, EM-01, EM-07)

Of ACRP 56's top 20 GHG emission-reduction measures, 10 measures fell into the Energy Management category.[533] These measures are listed here, and two are discussed in more detail in the subsections below:

- EM-08, Use thermal imaging to identify energy losses.
- EM-06, Develop and market an energy conservation program for building users.
- EM-18, Implement a lighting system energy conservation program.
- EM-31, Purchase Energy Star equipment.
- EM-38, Install window awnings or sunshades.
- EM-39, Utilize sophisticated energy models for building design.
- EM-37, Incorporate use of natural ventilation and economizer control.
- EM-10, Change set points or exclude selected zones from heating and cooling.
- EM-01, Develop a strategic energy management plan.
- EM-07, Evaluate fuel mix.

Because these measures deal with the airport's internal management, they are not likely to implicate major legal concerns, aside from general contract and landlord–tenant issues. However, state and local regulation could affect airports' efforts in some cases. See Section III.I. In particular, local zoning, building, and safety—especially electrical codes or utility codes related to energy metering—may place restrictions on projects that require structural or other system design changes. On the other hand, some state and local laws actively encourage airport energy management projects through incentives for energy conservation. State or local tax credits could help to underwrite energy-efficient equipment purchases, such as Energy Star equipment. Similarly, utilities might agree to help finance some upgrades or renovations as part of a state-mandated, demand-side management program. Such efforts could be integrated with efforts to develop energy management programs and energy models for building design.[534]

2. Implement a Lighting System Energy Conservation Program (ACRP 56 EM-18)

Lighting at airports can account for up to 40 percent of airport electrical use.[535] Airport efforts to conserve energy from lighting terminals and other facilities (aside from the runways and taxiways discussed below) can take many forms. One of the most common measures airports have taken to improve lighting-system efficiency is the installation of energy-efficient lighting fixtures. One-hundred and -seven of the 141 GAO Report's survey respondent airports indicate that they use energy-efficient lighting at their airports. Another 50 airports have automated dimmer switches for lighting, and 27 airports report the use of room occupancy sensors.[536]

ACRP has previously investigated energy conservation at airports and has identified energy management control systems, also known as building automation systems, as a best practice.[537] Automatic lighting systems react automatically to the operating environment and can adjust as necessary.[538] For example, such a system might dim artificial lighting in the presence of

[527] http://www.gsa.gov/portal/content/103656.

[528] Available from author upon request.

[529] http://files.ali-aba.org/thumbs/datastorage/skoobesruoc/source/CP010_Yi--RealPac_Green_Office_Lease_thumb.pdf.

[530] http://sustainca.org/green_leases_toolkit; See generally Pablo O. Nuesch, Beyond Environmental Compliance: Green Leasing, Presentation to Airports Council International–North America Spring Legal Issues Conference, San Antonio, Tex., Apr. 16, 2010, *available at* http://74.209.241.69/static/entransit/9-2-Nuesch_BeyondEnvironmentalCompliance.pdf.

[531] Brian Johnson, *MSP Airport Plans Energy, Restroom Upgrades* (Jan. 9, 2012), *available at* http://finance-commerce.com/2012/01/msp-airport-plans-energy-restroom-upgrades.

[532] *Id.*

[533] ACRP 56, tble. ES-5, items 2, 3, 9, 11, 12, 13, 14, 15, 19, 20, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_056.pdf.

[534] *See* § III.H.2.

[535] AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, SYNTHESIS 21, AIRPORT ENERGY EFFICIENCY AND COST REDUCTION 27 (2010), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_021.pdf.

[536] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 68.

[537] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 525, at 11–13.

[538] *Id.* at 10.

natural illumination from daylighting or skylighting. A control system could also turn off noncritical systems during peak demand periods, which could provide economic benefits to airports using real-time or time-of-use utility pricing. The installation of lighting controls at airports has an estimated payback period of 2 to 10 years.[539]

As noted above, this measure does not involve major legal concerns aside from general contracting and landlord–tenant issues. For example, a sponsor's ability to require its tenants to engage in certain energy conservation practices through an energy conservation program might be limited by existing contractual or leasing obligations with these tenants. In such cases, the expiration of contracts and leases can provide good opportunities for airport authorities to negotiate new terms.

3. Purchase Energy Star Equipment (ACRP 56 EM-31)

Energy Star is a federal program designed to identify energy-efficient equipment and products, making it easy for consumers, including airports, to recognize and purchase these products and reduce their energy consumption and related pollution. Energy-savings requirements may vary based on the type of product and available technologies.

Energy Star equipment exists in a variety of product categories, including computer equipment, copiers and fax machines, water coolers, televisions, commercial lighting, and commercial heating and cooling products. Detailed information on airport use of Energy Star equipment is not readily available. Anecdotal evidence, however, indicates that the practice is fairly common. For example, 67 of 141 airports responding to the GAO Report environmental survey indicated that they have an Energy Star heating, ventilation, and air conditioning (HVAC) system.[540]

As with the measures listed above, this measure does not involve any major legal concerns aside from general contracting and landlord-tenant issues.

4. Enter Into a Green Power Purchase Agreement (ACRP 56 EM-04)

In addition to reducing the use of energy, airports can reduce the GHG footprint of consumed electricity by purchasing power that is generated with fewer GHG emissions per kilowatt-hour. "Green" power emits fewer GHGs than conventional power and is frequently sourced from renewable resources such as wind or solar facilities. Airports or general purpose governments can procure "green" power through power purchase agreements (PPAs), which often address means of generation, pricing, and other elements of power production.

A number of airports use PPAs to procure green power. For example, Fresno Yosemite International Airport recently entered into a PPA with a third party that operates a 2.4 megawatt solar array to fuel approximately 40 percent of the airport's everyday lighting, air conditioning, and control and tower communications equipment needs.[541] The project is projected to save the airport more than $13 million in electricity costs over 25 years.[542] Between June 2008 and December 2010, Fresno Yosemite's purchase of green power avoided approximately 8,200 tons of CO_2 that would have been produced if the airport's energy had been generated by coal.[543] Denver International Airport also procures solar power through PPAs.[544] An example of the PPA legal language at Denver International Airport is available in the FAA's 2010 *Technical Guidance for Evaluating Selected Solar Technologies at Airports*.[545]

PPAs are simply contracts in which one party agrees to purchase power generated by another party. Often, the third-party developer owns, operates, and maintains generation infrastructure located on the purchaser's property.[546] However, there is no universally standard PPA, because each is the product of individual needs and circumstances and must also conform to state and local regulatory requirements. Some of the terms that PPAs will likely need to address include:

- Responsibility for initial financing.
- Contract term and price.
- Minimum purchase and generation requirements.
- Location of the energy-generating resources.
- Ownership of the energy-generating resources.
- Maintenance of the energy-generating resources.
- Risk of loss.
- Assumption of tax benefits or liabilities.
- Ownership of RECs, if any, associated with the project.

These terms will need to be considered through the lens of reasonableness to ensure that the PPA promotes the airport's long-term aeronautical mission.

The development of PPAs for power generated at airports can raise other unique issues. If PPAs provide that power generation resources are to be sited on airport land, long-term lease issues may arise as discussed

[539] Individual airport payback periods may vary based on conditions such as utility rates, hours of operation, design condition requirements, etc. *Id.* at 13.

[540] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 68.

[541] Matthew McDermott, *Solar Power Array Installed at Fresno Yosemite International Airport*, TREEHUGGER (July 17, 2008), http://www.treehugger.com/files/2008/07/solar-power-array-fresno-international-airport.php.

[542] Fresno Yosemite International Airport, Solar Report, http://webkiosk.mypvdata.net/c/fresno_airport/ (last visited June 15, 2012), http://webkiosk.mypvdata.net/c/fresno_airport/index.php?pg=weekly&hl=weekly.

[543] *Id.*

[544] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 51.

[545] *Id.* at App. D.

[546] U.S. Environmental Protection Agency, Solar Power Purchase Agreements (2010), http://www.epa.gov/greenpower/buygp/solarpower.htm (last visited June 15, 2012).

above in the context of carbon-sequestration approaches.[547] A long-term lease of land for electricity generation (including lease provisions in a PPA) might be considered an encumbrance on title in violation of FAA grant assurances and thus require a land release from FAA depending on how the power and other benefits flow to the airport. Further, ALP approval, land use, and environmental approvals would need to be addressed.[548]

As with all airport spending, limitations on revenue use and grant restrictions may apply to airport PPAs.[549] The direct purchase of power generated by a third party may be considered a more appropriate revenue use than the separate purchase of RECs. The purchase of power produced at or near an airport for use by the airport clearly serves an aeronautical purpose. Use of airport funds and creation of airport risk for a commercial power venture that services other public demand or municipal demand would raise many more questions. Incremental costs of green energy contracts are comparable to additional costs of other emission-reduction measures on the airport, such as the purchase of low-emitting GSE, and should be justified in the same way.

Whether unbundled RECs (i.e., RECs sold by themselves and not with the purchase of actual power) serve an aeronautical purpose could be a harder argument to make. RECs create a market incentive for the generation of renewable energy, frequently through subsidization of existing renewable energy production. However, there is typically no assurance that the renewable energy generated in the production of a REC will be consumed by the REC purchaser, or even their supplying energy utility. Airport purchases of RECs may thus be more akin to off-airport carbon offsets and raise similar self-sustainability and revenue diversion questions. For a more detailed discussion of carbon markets and airports, see ACRP Report 57.[550]

F. Ground Service Equipment

GSE engines are a significant source of GHG emissions on an airport and are often easier to control than aircraft or ground access vehicles. Airports, airlines, FAA, and others have worked for many years to reduce GSE emissions through the use of alternative fuels and other approaches, but there are additional opportunities for GHG reductions from GSE at most airports.

1. Support Alternatively Fueled Ground Service Equipment (ACRP 56 GS-01)

Although airports own some ground-based equipment, a large share of GSE at airports is owned by airlines, cargo handlers, or FBOs.[551] Airports may be able to require, incentivize, or assist tenants in procuring and using equipment that operates on alternative fuels. These various strategies and their accompanying legal considerations are discussed below.

a. Procurement of GSE.—Many airports purchase and operate their own alternative-fuel GSE, which has been a way for many airports to improve local air quality in areas not meeting federal health-based air quality standards. Of the 141 airports responding to GAO Report's survey, 15 airports indicated that alternatively fueled vehicles comprised more than half of their fleet, 14 indicated that they comprise about half their fleet, and 65 airports indicated that they had some alternatively fueled vehicles.[552] For example, 84 percent of Los Angeles World Airports' pool vehicles are natural gas vehicles.[553]

Sponsors seeking to procure alternative-fuel vehicles for their own GSE may need to adopt airport policies to allow or encourage these developments. For example, airports may need to update procurement lists to add a preference for alternative-fuel vehicles, or authorize increased purchase prices to account for the incremental cost of alternative-fuel vehicles.

b. Providing Incentives for Tenant Use of GSE.—Airports can also encourage their tenants to use alternatively fueled GSE. Financial incentives are the least-intrusive measures through which airports might do this. Financial incentives may be an attractive option where existing use and lease agreements (or other contracts) limit an airport's immediate ability to impose restrictions on tenant vehicle use. Varying fees based on vehicle emissions or fuel type is one potential preferred-pricing mechanism. The expiration of leases, use agreements, and other contracts provides an opportunity for airport authorities to renegotiate contracts to include mandatory or other alternative-fuel vehicles provisions. However, airport operators should be aware that requirements relating to alternatively fueled vehicle use at airports are subject to reasonableness, exclusive rights, and unjust discrimination considerations.[554]

c. Building Infrastructure to Support Tenant Use of GSE.—To support efforts to incentivize GSE, airports can build alternative-fuel vehicle infrastructure at or

[547] *See* §§ III.C and III.F.

[548] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Assurance 4–Good Title), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf; *see also* 49 U.S.C. § 47106(b)(1).

[549] *See* § III.C.

[550] *See* ACRP Report 57, *The Carbon Market: A Primer for Airports*, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_057.pdf.

[551] PHILADELPHIA INTERNATIONAL AIRPORT, A STRATEGIC PLAN FOR THE EXPANSION OF THE CLEAN FUEL VEHICLE PROGRAM AT PHILADELPHIA INTERNATIONAL AIRPORT 37 (2004), *available at* http://www1.eere.energy.gov/cleancities/pdfs/phl_afv_strategy_plan.pdf.

[552] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 45.

[553] LOS ANGELES WORLD AIRPORTS, SUSTAINABILITY REPORT 22 (2009), *available at* http://www.lawa.org/uploadedFiles/LAWA/pdf/Sustainability%20Report%20(7-14-08).pdf.

[554] *See* § III.E.

near the airport, such as clean natural gas or liquefied natural gas fueling facilities, biodiesel fuel pumps, or electric-vehicle-charging stations (including upgraded distribution lines).

To build GSE infrastructure, airports may choose to take a "Service Performance" approach and release an RFP for fueling infrastructure requiring bidders to meet certain requirements such as minimum functional capacity requirements.[555] Under this approach, specifics of station design (i.e., equipment to be used, location of components, etc.) are left to bidders. Under the Clean Fuel Project at the Philadelphia International Airport, third parties bidding on Service Performance RFPs for alternative fueling stations are likely to seek "take-or-pay" agreements committing airports to minimum fuel volume commitments.[556] The reasonableness of the terms of such commitments is likely to receive scrutiny from airlines and other users under revenue diversion, self-sustaining airport, and related principles. Airports can also choose to undertake the design of fueling or charging stations themselves.

According to the GAO Report, 52 of the 141 responding airports indicated that they provide infrastructure for electrified ground equipment.[557] At least 21 airports currently have natural gas stations; at least another eight were in the design, build, or permitting process.[558]

It is not clear how many of the stations in the GAO Report were on the airside or landside of the airports, but the location of fueling stations is an important consideration for airports, because security concerns may limit the ability of vehicles to travel between the airsides and landsides of airports. For example, taxis are not practically able to enter the airside of the airport, while baggage tugs, belt loaders, and some other GSEs might not be street-legal and able to access a fueling station on the landside of the airport.

d. Requiring Tenant Use of GSE.—In areas where compliance with air quality standards is a challenge, airports have explored requiring tenants to procure and use alternative-fuel GSE. The imposition of such requirements is the most aggressive position that airports can take with regard to this measure. It involves mandates to tenants to convert some or all of the GSE to lower-emitting units, such as through the use of electric equipment.

The implementation of this measure merits serious legal consideration. Courts have confirmed that states can require the use of low-emissions construction vehicles and equipment by government fleets as an exercise of their market power without running afoul of preemption under the CAA, so long as the costs are reasonable.[559] However, the edges of the doctrine are not precise. Based on existing case law, airports are likely to be on the strongest ground under this doctrine if conversion of the GSE would help meet regulatory requirements or facilitate airport development. If the mandate would interfere with airline or aircraft operations (for example, by reducing operations or affecting the use of particular aircraft), the airlines could also make plausible preemption arguments under the federal aviation laws. However, these preemption arguments could probably be addressed through careful tailoring of the rules to avoid impacts on aircraft operations.

e. Federal Funding for Supporting GSE.—The FAA offers support for alternative fuel GSE through its VALE program.[560] VALE funding may be available to help cover the costs of some of these vehicles for airports in nonattainment areas for criteria pollutants.[561] Through this program, the FAA has awarded AIP funding to several airports—including Lehigh Valley International, University Park, Philadelphia International, Norman Y. Mineta San Jose International, Westchester County, and George Bush Intercontinental Houston—for the purchase of low-emitting GSE.[562]

Low-emissions systems and other air quality projects that are not funded through the VALE program must be a sponsor's compliance responsibility under the CAA to receive AIP funding. [563] As with the VALE program, AERCs must be acquired for stand-alone, low-emissions vehicle or equipment AIP projects.[564]

Airports funding the acquisition of low-emission vehicles through FAA's VALE or AIP programs will need to contractually commit to maintaining and using low-emission vehicles for which AERCs are procured for their useful life.[565] Additionally, funded vehicles must be "dedicated to the airport" and "used in close proximity to the airport boundary."[566] These vehicles may

[555] PHILADELPHIA INTERNATIONAL AIRPORT, *supra* note 551, at 44.

[556] *Id.* at 45.

[557] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 44.

[558] Dan Huberty, Funding Natural Gas Fueling Stations 2, Presentation on Behalf of Clean Energy to Airports Going Green Conference, Chicago, Ill., Nov. 16, 2010, *available at* http://www.airportsgoinggreen.org/Content/Documents/dan%20huberty.pdf.

[559] *See* §§ III.A.1 and III.C.

[560] Federal Aviation Administration, Voluntary Airport Low Emissions Program (VALE), *available at* http://www.faa.gov/airports/environmental/vale/ (last visited June 15, 2012).

[561] *See* § III.D.3.

[562] Federal Aviation Administration, VALE Program Grant Summary FY 2005–FY 2011, *available at* http://www.faa.gov/airports/environmental/vale/media/VALE_grant_summary.pdf (last visited June 15, 2012).

[563] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK § 585(a) (2005), *available at* http://www.faa.gov/airports/resources/publications/orders/media/aip_5100_38c.pdf.

[564] *Id.*

[565] U.S. ENVIRONMENTAL PROTECTION AGENCY, GUIDANCE ON AIRPORT EMISSION REDUCTION CREDITS FOR EARLY MEASURES THROUGH VOLUNTARY AIRPORT LOW EMISSION PROGRAMS 13 (2004), http://www.faa.gov/airports/resources/publications/reports/environmental/media/AERC_093004.pdf.

[566] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK § 585(b) (2005), *available at* http://www.faa.gov/airports/resources/publications/

not be transferred out of the project geographic area, even where a potential transfer site is also out of compliance with federal air quality standards.[567] EPA further recommends that project sponsors develop and maintain usage records and use these records to update emissions-reduction estimates.[568]

f. Other Legal Considerations.—Because some ALP amendment may be necessary to place charging stations on a new footprint and federal funds or PFCs could be involved, NEPA and federal environmental statues may apply.[569] Charging stations or CNG fuel facilities are unlikely to require extensive environmental review, because they tend to be located on already-developed property or to involve a small physical footprint.

Additionally, state or local substantive environmental laws or fire, safety, and electric codes may be implicated.[570] For example, a number of states, including California and Texas, regulate CNG and liquefied natural gas fuel storage or dispensing.[571] Michigan also regulates the installation of CNG fueling stations in the state and requires all such stations to be certified by its Department of Natural Resources and Environment.[572]

State or local laws and regulations are often useful for maximizing the potential benefit of alternative-fuel measures. Airports have been able to work with air quality regulators to secure and "bank" air quality credits for future development in exchange for clean GSE programs even outside of the VALE context. For example, Seattle–Tacoma International Airport was able to work with the Puget Sound Clean Air Agency to earn AERCs for deployment of CNG vehicles.[573] The airport was able to "bank" these credits for up to 10 years to meet future emissions-reductions needs.[574] Wisconsin's Department of Natural Resources had developed a similar program, the Wisconsin Voluntary Emission Reduction Registry, which specifically contemplates the banking of GHG emissions-reductions credits to demonstrate compliance in the event of future regulation of global warming pollution.[575] However, this program was discontinued in 2008.[576] Airports should consider whether there are options to "bank" benefits of an alternative-fuel project for future use.

G. Ground Transportation

By design, large airports attract millions of visitors per year. Major U.S. airports also host an average of 40,000 daily employees.[577] This translates into a large number of daily vehicle trips to airports that generate significant GHG emissions. Thus, airports have explored measures that would reduce the number of trips to airports (through public transit and shared rides) and the amount of emissions per trip (through cleaner, more efficient vehicles and restrictions on idling).

According to the GAO Report, most airports reported that they had some programs and infrastructure in place to reduce emissions from ground transportation. Fifty-one airports reported that they had no transportation programs in place to reduce emissions.[578] Thirty of the respondent airports indicated that they have no transportation facilities to reduce emissions, such as taxi-idling areas, passenger pickup lots, or consolidated car-rental facilities.[579]

1. Promote Public Transit to the Airport and Increase Mass Transit Access to the Airport (ACRP 56 GT-03, GT-05)

Increasing the share of passengers that use public transit can reduce potential car trips, and thus reduce GHG emissions. However, a recent ACRP effort reported that only 27 U.S. airports have a public transportation (rail, bus, and shared van) mode share of more than 6 percent.[580] Only two-thirds of airports responding to the GAO Report's survey have a public bus stop; only a quarter have a rail station.[581]

orders/media/aip_5100_38c.pdf.

[567] U.S. ENVIRONMENTAL PROTECTION AGENCY, *supra* note 565, at 13.

[568] *Id.* at 14.

[569] *See* § III.J.

[570] *See* §§ III.I and III.K.

[571] CAL. CODE REGS. tit. 8, §§ 523–544; 16 TEX. ADMIN. CODE §§ 13-14.

[572] MICH. ADMIN. CODE r. 29.4601–29.4652 (1995); Michigan Business One Stop, Storage Tank Compressed Natural Gas Site Plan Certification, http://www.michigan.gov/statelicensesearch/0,1607,7-180-24786_24825-245026--,00.html (last visited June 15, 2012).

[573] PHILADELPHIA INTERNATIONAL AIRPORT, *supra* note 551, at A23.

[574] *Id.*

[575] *Id.* at A29 et seq. (2004) (citing Wisconsin Department of Natural Resources, The Wisconsin Voluntary Emission Reduction Registry, Draft Document (2002)).

[576] Wisconsin Department of Natural Resources, The Wisconsin Voluntary Emission Reduction Registry, *available at* https://docs.google.com/viewer?a=v&q=cache:MSFz9aJe7c4J:www.nescaum.org/projects/greenhouse-gas-early-action-demonstration-project/ghg-state-registry-collaborative/wisconsin.pdf+Wisconsin+Department+of+Natural+Resources,+The+Wisconsin+Voluntary+Emission+Reduction+Registry&hl=en&gl=us&pid=bl&srcid=ADGEESidF0H1G6FdFffGRW3NhohPk4z0TSN3S7beC90QG26-Mc-dqhaB82exriWRZaLEADVcnaVi7BAa948S15yTSYZUZwF2d91U7IdEIQNaMB8YUM4LjS1hTTO2WoVE5KrMM1kFTN50&sig=AHIEtbQ8V2RhofnUIFmR9YMhjdZGWJH6yA.

[577] AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, REPORT 4, GROUND ACCESS TO MAJOR AIRPORTS BY PUBLIC TRANSPORTATION 12 (2008), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_004.pdf.

[578] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 42.

[579] *Id.* at Q 43.

[580] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 577, at 35.

[581] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 43.

Many airports have made efforts to improve transit accessibility and ridership through a variety of strategies. For example, airports have worked with local transit agencies to improve their connections with central business districts and larger transit systems, establish more reliable service, expand mass transit infrastructure, and provide access to transportation services in or near the terminal.[582]

Efforts to improve transit to airports implicate legal questions about federal funding. Congress has specifically encouraged the construction of intermodal transit systems at airports, declaring that it "is the policy of the United States…(5) to encourage the development of intermodal connections on airport property between aeronautical and other transportation modes and systems to serve air transportation passengers and cargo efficiently and promote economic development."[583] However, in so declaring, Congress did not alter any of the underlying legal standards applicable to airport capital projects, including the use of airport revenue for aeronautical purposes.

FAA has stated that a transit project can be funded with airport revenue if it can be considered 1) a capital cost of the airport, or 2) a local facility owned or operated by the airport owner or operator and directly and substantially related to the air transportation of passengers or property.[584] FAA has further stated that ground access projects will be considered a capital cost of the airport only if they are

> on the airport, constructed exclusively for airport use, and integrated into the airport terminal complex…. All other ground access facilities would be evaluated against the requirement that they be facilities "owned or operated by the airport owner or operator and directly and substantially related to the air transportation of passengers or property."[585]

Some ambiguity exists as to whether airport revenue may be used for facilities that are located off the airport. On the one hand, FAA has, in the past, advised that airport revenue may only be used for transit facilities located *on the airport*. On the other hand, the statute appears to permit the use of airport revenue for facilities that are located *off the airport*. Additionally, FAA's *Bulletin 1: Best Practices—Surface Access to Airports* (the Bulletin) also seems to recognize use of airport revenue for off-airport use as permissible. Specifically, the Bulletin provides that airport revenue cannot be used for any part of the project that is not "necessary for the purpose of serving airport passengers."[586] It further provides that "airport funds must be prorated to airport use" based on ridership.[587] However, a rail system that was designed and constructed for the exclusive use of airport passengers, which carries nonairport passengers only incidentally, would not require prorating costs.[588] These provisions of the Bulletin suggest that the FAA contemplates the use of airport revenue for certain transit facilities off-airport, as long as they are "necessary…for serving airport passengers."[589]

AIP funds and PFC revenue can be used for ground access projects 1) to connect the transit system to the nearest transit line of sufficient capacity to accommodate airport traffic, and 2) that are located on-airport or within a right-of-way owned by the airport sponsor.[590] While airport revenue can be used to fund the airport-related portion of a transit project carrying nonairport passengers, AIP grants and PFC revenue eligibility are strictly limited to projects exclusively serving airport passengers.[591] This is the principal difference between the AIP/PFC eligibility requirements and the conditions on use of airport revenue for transit projects.

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[582] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 577, at 30.

[583] 49 U.S.C. § 47101(a).

[584] Federal Aviation Administration, Policy and Procedures Concerning the Use of Airport Revenue, 64 Fed. Reg. 7696, 7718 (Feb. 16, 1999); FEDERAL AVIATION ADMINISTRATION, BULLETIN 1: BEST PRACTICES–SURFACE ACCESS TO AIRPORTS 3, *available at* http://www.faa.gov/airports/resources/publications/reports/media/bulletin_1_surface_access_best_practices.pdf (last visited June 12, 2012). *See* § III.C.

[585] FEDERAL AVIATION ADMINISTRATION, BULLETIN 1, *supra* note 584, at 3–4, defining "operate" to mean that

> the local or state government or authority that owns or operates the airport is legally responsible for the operation of the ground access facility (e.g., transit system), and operates the facility either with its own employees or through a management contract with a private firm or other public agency. Subsidy of the local transit system is not considered "operation" of the system by the airport.

[586] *Id.* at 5.

[587] *Id.*

[588] *Id.* at 4–5.

[589] *Id.*

[590] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK §§ 620, 622(b) (2005), *available at* http://www.faa.gov/airports/resources/publications/orders/media/aip_5100_38c.pdf; the current eligibility standards for PFCs are explained in the FAA's Policy and Procedures Concerning the Use of Airport Revenue, 64 Fed. Reg. 7696, 7718 (Feb. 16, 1999). *See also* Air Transport Association of America v. FAA, 169 F.3d 1 (D.C. Cir. 1999) (Affirming FAA approval's of an Airport Layout Plan amendment to extend the JFK airport boundary to encompass the right-of-way for a light rail system along a narrow corridor extending several miles beyond the previous boundary, holding "there is nothing in the Handbook or the statute or regulations that indicates that airport-owned rights-of-way are outside the 'airport boundary,' and the FAA is reasonable in construing its own interpretive guidelines to mean that rights-of-way are within the airport boundary.").

[591] FEDERAL AVIATION ADMINISTRATION, Order 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK §§ 620, 622(b) (2005), *available at* http://www.faa.gov/airports/resources/publications/orders/media/aip_5100_38c.pdf; the current eligibility standards for PFCs are explained in the FAA's Policy and Procedures Concerning the Use of Airport Revenue, 64 Fed. Reg. 7696, 7718 (Feb. 16, 1999).

Examples

• The FAA approved San Francisco's use of airport revenue to construct an on-airport station connecting the Bay Area Rapid Transit (BART) system and the Airport Rapid Transit system based in part on the understanding that San Francisco would own the transit facilities. The FAA also emphasized the fact that the station would be used primarily, perhaps exclusively, by airport passengers and employees.[592] The FAA approved the use of airport revenue for a fixed-guideway system located on-airport on the same basis.[593] The FAA characterized the airport-dedicated transit system to be an airport capital project, but advised that the BART extension would not be an airport capital project and instead would need to meet statutory revenue use criteria discussed above.[594] FAA also approved San Francisco's use of airport revenue for certain rail-line operating systems on the condition, among others, that "airport funding is limited to the portion of the equipment related to the [San Francisco International Airport] station and not the BART main line."[595] The FAA generally advised that airport revenue could be used on a prorated basis for items that are only partly airport-related,[596] but did not examine any specific proposal for prorating costs.

• The FAA approved the use of airport revenue to pay the full cost of two on-airport stations for a light rail project at Minneapolis–St. Paul International Airport. The project also involved the development of an underground rail line; however, the airport was not the intended terminus of the line, meaning that nonairport passengers would be using the transit system to travel through the airport. Approval of use of airport revenue for the station costs was granted on the basis that the stations would be used exclusively by airport passengers; the use of airport revenue was authorized only to cover a percentage of the cost of the tunnel, prorated based on the relative number of airport and nonairport passengers.[597] While the Bulletin states that airport revenue can be used only where the rail project is intended and projected to be used primarily by airport passengers, the FAA permitted the use of airport revenue for segments of the light rail system where less than half of the projected transit riders would be airport passengers, including one particular segment where only 14 percent of the projected transit riders would be airport passengers.[598]

In addition to mass transit solutions, airports can encourage modes of transportation that also reduce the number of car trips to and from the airport. For example, airports can encourage the use of van shuttles for passengers. To do this, airports can provide open access or exclusive/semi-exclusive concession agreements for ground access. Exclusive or semi-exclusive contracts may require concessionaires to provide some minimum level of service, which may help to increase the perception of reliability and, thus, use of shared van services. However, passengers may prefer a more competitive market with lower fares. Airports can also try to encourage or require the use of more efficient shuttle vehicles with lower emissions. Additionally, airports can encourage use of shared-use vehicles by providing high-occupancy-vehicle lanes or special access to passenger drop-off areas for shared vans and buses.

2. Support Alternatively Fueled Taxis (ACRP 56 GT-17)

Airports can support or seek to require the use of alternatively fueled taxis or buses at airports through a number of means. As discussed above, airports can facilitate access to natural gas or other alternative-fuel stations in the vicinity of airports. Airports may also be able to provide alternative-fuel taxis, buses, or other vehicles with preferential access, relative to conventional vehicles, to passenger drop-off and pickup points. These strategies and their legal implications are described below.

a. Requiring Alternatively Fueled Taxis.—An airport's ability to require that private taxi fleet operators purchase alternatively fueled vehicles has not yet been directly tested in court, but it is possible that such a policy would be challenged under the preemption provisions of the CAA discussed in Section III.A.1. However, airports would have a strong counterargument to these claims under the market participant doctrine presented in Section III.A.1.c.

Efforts to negotiate alternatively fueled vehicle commitments into contracts may also be made more challenging at most airports by complex and varying ownership regimes for taxis. For example, airports are likely to face greater challenges negotiating contracts that favor alternative-fuel taxis where vehicles are individually owned by drivers, rather than by taxi companies. The situation would be less complex in situations where the airport negotiates with a single or limited number of companies.

b. Providing Incentives for Use of Alternatively Fueled Taxis.—Generally, airports have the legal authority to impose access fees, charges, and conditions on off-airport businesses that access the airport—strategies that can be used to encourage the use of alternatively

[592] Letter from Susan Kurland, FAA Associate Administrator for Airports, to John Martin, San Francisco International Airport, at 6 (Oct. 18, 1996).

[593] *Id*. at 6–7.

[594] *Id.* at 6 (Oct. 18, 1996); *see* also 49 U.S.C. § 47107(b)(1)(C).

[595] Letter from Susan Kurland, FAA Associate Administrator for Airports, to John Martin, San Francisco International Airport, at 7–8.

[596] *Id.* at 5.

[597] Letter from David Bennett, FAA Office of Airport Safety and Standards, to Thomas Tinkham (Nov. 21, 2000); Letter from Nancy Nistler, FAA Minneapolis Airports District Office, to Nigel Finney, Metropolitan Airports Commission (Apr. 25, 2000).

[598] *Id.*

fueled taxis.[599] For example, airports can require shuttles or buses to use different lanes than those used by taxis or passenger vehicles within the airport to reduce congestion at an airport. However, state or local restrictions may limit the ability of airports to condition access to certain roads classified as public streets. Similarly, other governmental entities (e.g., public utilities commissions) may have primary responsibility for regulating taxis, buses, shuttles, and vans, such that some airport-imposed measures to reduce GHG emissions from those vehicles would be preempted as a matter of state law.

Airports may also be able to incentivize adoption of alternative-fuel vehicles by private operators through contracting, concession, or permitting programs for ground transportation services. Similarly, some airports have included measures to encourage rental car operators to make greater numbers of clean vehicles available to rent. For example, San Francisco International Airport's contracts with rental car providers include incentives for customers and companies to increase rentals of cleaner vehicles.[600]

One particular type of incentive scheme has generated litigation from taxi drivers—the taxi "queue jump." This scheme gives taxi drivers operating electric or hybrid-electric vehicles an advantage by pushing higher-emitting vehicles to the back of the line.

In March 2010, the City of Dallas enacted an ordinance authorizing taxicabs operating on CNG to advance to the "head of the line" and pick up customers before all other taxis at Dallas Love Field Airport.[601] The City enacted the legislation to improve air quality in the Dallas area, a CAA nonattainment area for ozone pollution. The ordinance was challenged by the Association of Taxicab Operators, USA, a Texas nonprofit organization representing its members.[602] According to the complaint, only 8 to 10 of hundreds of taxicabs currently operating at Love Field are fueled by CNG.[603]

Taxicab Operators alleged that the ordinance was a "standard relating to the control of emissions from new motor vehicles," in violation of the CAA's Section 209(a) preemption provision.[604] The Association sought injunctive relief, restraining Dallas from enforcing the challenged regulation.[605] In the City's responsive motion, it framed the ordinance as an incentive program rather than an emissions mandate.[606] The City also emphasized the lack of mandated quantitative emissions levels, purchase requirements, mandated emissions control technology, and penalty or fee system.[607] Further, the City emphasized that the City, as the airport owner, has proprietary authority to regulate the types of vehicles in operation at the airport.[608]

In August 2010, the U.S. District Court for the Northern District of Texas denied the Association's request for a preliminary injunction, making a preliminary finding that the Association had failed to demonstrate that the City's ordinance is an emission standard under federal law.[609] In March 2012, the court granted the City's final motion for summary judgment finding that as a matter of law, the Dallas City Ordinance was not preempted by the CAA.[610]

A similar battle is being waged at Dallas/Fort Worth International Airport. In 2009, the airport board approved a queue-jumping policy for CNG taxis. The Association of Taxicab Operators sued and obtained a temporary restraining order that dissolved in October 2011. In January 2012, the airport board again approved the policy. As of this writing, the airport anticipates that the Association of Taxicab Operators may sue again.[611]

H. Materials and Embedded Energy

This category of GHG-reduction measures addresses the fact that it takes energy to produce and distribute the wide array of products that are used and sold at an airport, such as canned beverages, paper towels, and office products. Reducing the waste of these products reduces the overall emission of GHGs. In addition, diverting some organic waste from landfills can reduce the formation of methane gas, which is a GHG more potent than CO_2.

1. Start or Enhance a Waste Reduction or Recycling Program (ACRP 56 ME-02)

The majority of 141 airports responding to the GAO Report's environmental survey have some sort of recy-

[599] *See* § III.C.5.

[600] Press Release, San Francisco International Airport, Mayor Newsom Kicks Off "Green" Rental Car Program at SFO (Jan. 13, 2009), *available at* http://www.flysfo.com/web/page/about/news/pressrel/2009/sf0903.html.

[601] Frank Heinz, *CNG Cabs Can Cut to the Front*, NBC DALLAS FORTH WORTH, Mar. 10, 2010, *available at* http://www.nbcdfw.com/traffic/stories/CNG-Cab-Can-Cut-to-the-Front-87263992.html.

[602] Complaint at ¶ 2, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K (N.D. Tex. Apr. 15, 2010).

[603] Complaint at ¶ 13, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K (N.D. Tex. Apr. 15, 2010).

[604] 42 U.S.C. § 7543(a); s*ee* § III.A.1.b.

[605] Complaint ¶ 20-21, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K (N.D. Tex. Apr. 15, 2010).

[606] Response at 30, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K (N.D. Tex. Apr. 27, 2010).

[607] Response at 29-30, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K (N.D. Tex. Apr. 27, 2010).

[608] Response at 20-21, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K (N.D. Tex. Apr. 27, 2010).

[609] Order Denying Preliminary Injunction at 1, Assoc. of Taxicab Operators, USA v. City of Dallas, No. 3:10-cv-00769-K, 760 F. Supp. 2d 693 (N.D. Tex. Aug. 30, 2010).

[610] 2012 U.S. Dist. LEXIS 42832 (March 28, 2012).

[611] Andrea Ahles, *DFW Airport OKs Giving Priority to Natural Gas Taxis*, STAR-TELEGRAM, Jan. 5, 2012, *available at* http://www.star-telegram.com/2012/01/05/3638585/dfw-airport-board-oks-giving-priority.html.

cling program, including elements for plastic (91), aluminum (103), glass (78), and paper (114). Only nine airports reported that they had no recycling program.

For example, at Seattle-Tacoma International Airport, the Port of Seattle collects standard recycling items such as aluminum and paper, as well as cooking oil, coffee grounds, batteries, printer/copier cartridges, pallets, and plastic films.[612] Seattle-Tacoma also provides incentives for concessionaires to recycle by charging retailers by quantity for waste disposal and not charging for recycling.[613] In 2009, Seattle-Tacoma diverted 1,300 tons of recyclable or compostable materials from landfills.[614] Seattle-Tacoma began collecting even more material when it introduced an off-aircraft recycling system in 2010. Airlines at Seattle-Tacoma are incentivized to participate through a charging system similar to that in place for retailers. According to the Port of Seattle, the program will save it more than $250,000 per year by reducing pickups and waste disposal.[615]

These types of waste reduction or recycling programs are unlikely to raise significant legal issues. Further, airports can and often do create waste-reduction and recycling requirements for tenants through leases, minimum standards, rules, and regulations.

2. Start or Enhance a Green Procurement Program (ACRP 02-19 ME 03)

Green procurement at airports can take many forms. As discussed above, airports can purchase Energy Star or other energy-efficient office or other equipment, purchase alternative-fuel or more efficient fleets, and acquire energy-efficient lighting. Airports can also reduce their GHG footprint by procuring materials with recycled content or lower life-cycle GHG emissions. For example, airports may be able to offer toilet paper or paper towels with high recycled content in restrooms. Because such a strategy is one of internal management, it is unlikely to implicate any major legal issues.

In addition to engaging in green procurement themselves, airports may also be able to require green procurement by tenants, for example through binding concessions agreements, leases, and other contracts. Such measures are also unlikely to implicate major legal concerns, but managers should keep in mind general contract and landlord-tenant issues.

I. Operations and Maintenance

Airport operations include a variety of activities to support passenger travel and goods movement, including safety and security, facilities management and maintenance, fueling and maintenance of vehicles and GSE, landscaping, maintenance of the airfield, and construction. All of these activities generate GHGs and most can be managed in a way to reduce GHG emissions.

1. Create a Detailed Operations and Maintenance Manual (ACRP 56 OM-01)

Development of an operations and maintenance manual that considers energy efficiency and GHG reductions can reduce emissions. The City of Chicago offers detailed strategies for reducing the environmental effects of airport operations and maintenance in its 2010 version of the *Sustainable Airport Manual*.[616] *The Sustainable Airport Manual* is an example of a detailed document that can be used to guide operations and maintenance procedures to promote environmental sustainability. Many measures proposed therein would directly reduce GHG emissions. Los Angeles World Airports, the entity that manages Los Angeles International Airport and other area airports, has also issued sustainability guidelines, but these are currently being revised to ensure consistency with new state and local building codes.[617]

Airports seeking to reduce GHG emissions through operational or maintenance procedures may choose to develop individualized or more detailed strategies that are tailored to conditions at individual airports, such as particular geographies, facilities, and so on. For example, the Port Authority of New York and New Jersey develops a maintenance manual defining maintenance measures and schedules for each individual building it controls.[618]

2. Use a Computerized Maintenance Management System (ACRP 56 OM-03)

Airports can use a computerized maintenance management system to automate management of everything from electrical pumps to baggage systems to HVAC systems. Through automated tracking of maintenance needs, airports may be able to reduce unnecessary maintenance or ensure maintenance needed for optimal efficiency. A survey of 20 airports conducted by ACRP in 2007 indicated that less than half of surveyed airports used a computerized maintenance manage-

[612] Port of Seattle, SEA-TAC Airport Debuts Innovative Off-Aircraft Recycling System (Apr. 14, 2010), *available at* http://newswire.enviro.aero/newswire/2010/Apr/14/sea-tac-airport-debuts-innovative-off-aircraft-recycling-system.

[613] *Id.*

[614] *Id.*

[615] *Id.*

[616] CHICAGO DEPARTMENT OF AVIATION, SUSTAINABLE AIRPORT MANUAL (2010), *available at* http://www.airportsgoinggreen.org/Content/Documents/CDA%20SAM%20-%20v2%200%20-%20November%2015%202010%20-%20FINAL.pdf.

[617] Los Angeles World Airports: Sustainability, http://www.lawa.org/welcome_LAWA.aspx?id=1036 (last visited Jan. 30. 2012).

[618] Susanne Des Roches, Port Authority of New York and New Jersey (PANYNJ), Sustainable Design Guidelines at the Port Authority of New York and New Jersey 9, Presentation to Airports Going Green Conference, Chicago, Ill., Nov. 15, 2010, *available at* http://www.airportsgoinggreen.org/Content/Documents/Susanne%20DesRoches.pdf.

ment system, and that such systems are used predominantly at larger airports.[619]

J. Performance Measurement

Performance measurement involves quantifying GHG emissions or energy use levels, and then comparing these data to an airport's regulatory requirements and environmental goals. Performance measurement is based on the management maxim that one cannot manage what one cannot measure.

1. Conduct Regular Greenhouse Gas Emission Inventories (ACRP 56 PM-01)

Development of a GHG inventory is a fundamental step towards management of GHGs and tracking progress in reducing them. Over a third of the 150 busiest U.S. airports, including two-thirds of the 141 GAO Report's survey respondent airports of large and medium size, conducted a general airport emissions inventory between 2007 and 2010.[620]

Understanding the source of GHG emissions can help airports to target reductions measures. Inventories can also provide a baseline against which to measure accomplishments and identify opportunities for additional reductions. A recent ACRP guide can assist airports in preparing their airport GHG inventories by offering specific direction on how airports can calculate emissions from individual sources, as well as how to compare the different types of GHGs.[621] It recommends adoption of a community-scale analysis of emissions, while also encouraging airports to document ownership and control of emissions sources.[622]

FAA's Sustainable Master Plan grant pilot program, discussed at Section III.B.1, with its observed benefit of carbon footprint reduction, demonstrates FAA's recognition of the value of measuring environmental performance, including in the area of GHG reductions. Emissions inventories can offer sponsors valuable information to guide mitigation efforts. Perhaps the most obvious benefit of GHG inventories is ensuring regulatory compliance. A small number of high-activity airports could have stationary sources that produce emissions above the regulatory reporting trigger established by EPA. Additionally, as discussed in Section III.J.2.a, states such as California are increasingly scrutinizing GHG emissions at airports, particularly as a part of state-law environmental review of airport expansion plans. Ensuring regulatory compliance and preparing for future compliance is at the core of an airport's proprietary authority. Airports might justify expenditures on inventories by grounding such efforts as an appropriate exercise of this authority.

2. Install Tenant Energy Sub-Metering Systems (ACRP 56 PM-03)

While energy audits can provide useful information about the energy used directly by the airport operator, sub-metering can help manage the energy use of individual concessionaires or other tenants. Sub-metering allows airports to record (and often charge for) the electricity use of individual tenants through the installation of individual meters at specific terminals, kiosks, airport ticket counters, restaurants, newsstands, car rental agencies, airline gates, or other points of electricity use.

An understanding of tenant energy use can help airports to work with tenants to reduce their emissions. For example, sub-metering can allow airports to disaggregate energy charges from rent charges by charging tenants for their actual, rather than estimated, energy use. Where tenants are responsible for the direct costs of energy use, they have a stronger financial incentive to adopt conservation measures that can reduce electricity use and GHG emissions.

A number of airports already meter tenant utility usage individually for some or all utilities. For example, Denver International Airport sub-meters natural gas usage by some terminal tenants, ensuring that they are charged for what they use.[623] Sub-metering accompanied with pricing that corresponds directly with or increases with energy usage can incentivize airport energy users to reduce their consumption. Airports will need to ensure that they do not engage in unjust discrimination in their billing of sub-metered tenants. For example, a decision to sub-meter some tenants but not others, absent a reasonable explanation and basis for allocating cost, might be controversial.

Further, airports must ensure that sub-metering programs are reasonable. For example, an airport could seek voluntary modification of an existing contract specifying energy prices—but may not be able to demand a contract modification. Additionally, airport energy use charges should comport with actual costs incurred to provide energy for tenant use at airports. Airports that benefit from a declining block rate utility pricing structure might be challenged were they to adopt inclining or flat block-rate utility pricing for tenants and would likely need to justify charges to the extent that they deviated from actual incurred utility costs.

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[619] AIRPORT COOPERATIVE RESEARCH PROGRAM, *supra* note 525, at 4.

[620] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 39.

[621] AIRPORT COOPERATIVE RESEARCH PROGRAM, TRANSPORTATION RESEARCH BOARD, REPORT 11, GUIDEBOOK ON PREPARING AIRPORT GREENHOUSE GAS EMISSIONS INVENTORIES 11 (2009), http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf.

[622] *Id.* at 14.

[623] City and County of Denver Department of Aviation, Request for Proposals: Consumer Service Concession Voluntary Travel Carbon Offset Program 8 (Jan. 14, 2008), *available at* http://www.responsiblepurchasing.org/purchasing_guides/carbon_offsets/specs/ColoradoAirport_CarbonOffsetsRFP_2008.pdf.

3. Perform Energy Audits (ACRP 56 PM-02)

Energy audits offer airports a means to identify opportunities for airport energy use and cost savings, and are also important elements of airport GHG emissions inventories. Important elements of an airport energy audit include:

- Identification of energy use in various areas such as HVAC, lighting, etc.
- Documentation of existing energy costs and sources.
- Identification of opportunities for and costs of energy and cost-savings.
- Determination of payback periods for identified conservation measures.

Energy audits are often useful first steps towards energy management efforts identified in Section IV.E.

K. Renewable Energy Production

Renewable energy is generated through non-fossil-fuel resources such as sunlight, wind, geothermal heat, or the movement of water.[624] As of 2008, approximately 7.5 percent of total U.S. energy consumption came from renewable resources; this percentage has increased over time.[625] The demand for renewable energy appears to be growing at airports, too. The GAO Report revealed that just under a third of the 150 busiest U.S. airports currently produce renewable energy on site.[626] Many of these and other airports also use electricity generated off site that involves some renewable generation.

1. General Legal Considerations for Implementing Renewable Energy Projects

Nearly any airport renewable energy project raises some general questions that are independent of whether the project uses solar, wind, or some other technology.

First, renewable energy measures that are disproportionately expensive may raise self-sustaining airport or revenue diversion concerns, discussed generally at Section III.C, particularly where facilities are located off-airport. Allowing the use of airport property for renewable energy projects undertaken by third parties may lead to self-sustaining airport violations if the airport does not receive fair market rentals, the power produced, or similar consideration. For example, if airport land is used for free for a renewable energy project that creates energy used for general municipal purposes or sale into the grid, there is a significant risk that FAA would consider the activity inconsistent with the self-sustaining airport requirements.

Other FAA-required airport sponsor grant certifications likely implicated by renewable energy projects include:

- Assurance 4, Good Title[627]
  - This grant assurance obligates airports to hold good title to the airport and in particular the parcels necessary to achieve the purpose of the particular grant to which the obligations are tied. Giving away good title for a renewable energy project could violate this grant assurance.
- Assurance 5, Preserving Rights and Powers[628]
  - An airport is obligated not to encumber, transfer, or dispose of its title or interest in property absent FAA approval. FAA is particularly concerned with the granting of property interests, particularly fee interests, to tenants,[629] which could include developers of on-site renewable energy.
- Assurance 20, Hazard Removal and Mitigation[630]
  - This grant assurance imposes an affirmative obligation on airports to prevent the establishment or creation of future airport hazards.[631] To comply with this grant assurance, airports may not construct renewable energy–related infrastructure or objects that would cause hazards to air navigation. Renewable energy projects would be subject to federal restrictions governing glare, wildlife hazards, or height standards at airports, among other requirements.

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[624] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 1.

[625] U.S. Energy Information Administration, Renewable Energy Consumption by Energy Use Sector and Energy Source 2004–2008 (2010), http://www.eia.doe.gov/cneaf/solar.renewables/page/trends/table2.html (last visited Jan. 26, 2011); U.S. Energy Information Administration, U.S. Energy Consumption by Energy Source 2004–2008 (2010), http://www.eia.gov/cneaf/solar.renewables/page/trends/table1.html (last visited June 15, 2012).

[626] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 67.

[627] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Assurance 4–Good Title), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf; *see also* 49 U.S.C. § 47106(b)(1).

[628] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Assurance 4–Good Title; Assurance 5–Preserving Rights and Powers), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[629] FEDERAL AVIATION ADMINISTRATION, Order 5190.6B, AIRPORT COMPLIANCE MANUAL § 6.3(b) (2009), *available at* http://www.faa.gov/documentLibrary/media/Order/5190_6b.pdf.

[630] FEDERAL AVIATION ADMINISTRATION, AIRPORT SPONSOR ASSURANCES (Mar. 2005) (Assurance 20–Hazard Removal and Mitigation), http://www.faa.gov/airports/aip/grant_assurances/media/airport_sponsor_assurances_2012.pdf.

[631] *Id.*

• Assurance 21, Compatible Land Use[632]

• Airports are obliged to take steps to restrict the use of land in the immediate vicinity of the airport to uses compatible with normal airport operations. To the extent that a renewable energy project was not compatible with normal airport operations, undertaking such a project could violate this grant assurance.

Second, airports must also assure compatibility of projects with airport design standards and the ALP.

Third, renewable energy projects that affect threatened or endangered species would be subject to the ESA and could also trigger state-level species protections.[633] Other legal issues (discussed in Section III.H) that may arise in the course of developing renewable energy projects at or near airports include:

• Whether a project is subject to FERC's regulatory jurisdiction.
• Whether the project would subject an airport to regulation as a utility under state law, or trigger other state or local rules relating to electric service.
• State utility law provisions related to renewable or alternative energy portfolio standards.
• State or local land use, zoning, or permitting requirements.
• Local building, mechanical, and safety codes.

Fourth, federal, state, and local programs, including those set forth in Section III.H, also may create financial incentives for renewable energy projects. Airport renewable energy project sponsors may be able to take advantage of state or federal tax credits, net metering, and PURPA-created markets for the resale of renewable energy generated by qualifying facilities.

2. Install Building-Mounted or Ground-Mounted Solar Photovoltaic Panels, and Install Solar Thermal Systems for Hot Water Production (ACRP 56 RE-02, RE-03)

PV panels convert sunlight to electricity and can be mounted on airport buildings or property. The FAA reports that PV technologies provide the best opportunity for airports to generate solar power, because they have the highest cost-to-benefit ratio and because they are most compatible with airport operations.[634]

Twenty-three of 141 airports responding to the GAO Report's environmental survey indicated that they produce solar energy at their airport.[635] A recent FAA analysis of 10 solar projects at airports showed a range of project sizes and locations, summarized below.[636]

FAA Surveyed Solar Projects at Airports[637]

Airport	Facility Type	Location	Size (in Mega-watts)
Albuquer-que Sunport	Roof	Carport roofs	0.146
Boston Logan	Roof	Parking Garage B	0.2
Houston George Bush	Roof	Terminal rooftop	0.06
San Francisco	Roof	Terminal 3	0.5
San Jose	Roof	Rental car facility	1.1
Subtotal 2.006			
Bakersfield Meadows Field	Ground	Between terminal and runway	0.748
Denver	Ground	Entrance road	2.0
Denver	Ground	Fuel farm	1.6
Fresno Yosemite	Ground	Runway end	2.0
Oakland	Ground	General aviation area	0.756
Subtotal 7.104			
Total 9.110			

Another type of solar technology is solar thermal. Solar thermal installations can help airports reduce GHGs by heating water or air with incoming solar energy, thus reducing the need for heating energy from nonrenewable resources. ACRP 56's highest ranking GHG-reduction measure calls for the installation of solar thermal systems for hot water production.[638]

With the exception of the last subsection, the issues described below apply to both solar PV and solar thermal. As discussed below, the issues surrounding solar PV projects are considerably more complicated because their electricity generation capacity can also implicate federal and state utilities laws.

[632] *Id.*

[633] *See* § III.K.

[634] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 8–9.

[635] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 380, at Q 67 (2010), *available at* http://www.gao.gov/special.pubs/gao-10-748sp/.

[636] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at B-2.

[637] Adapted from *Id.*

[638] ACRP 56, tble. ES-05, item 1, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_056.pdf.

a. FAA Guidance.—FAA's 2010 Technical Guidance for Evaluating Solar Technologies on Airports[639] indicates that the FAA will only approve on-airport solar projects where they are sited on aeronautically-compatible land, are consistent with an airport's Master Plan, involve the lease of land for fair market value, and meet preliminary environmental screening tests.

FAA recommends that project proponents conduct an initial environmental screening of their projects before they proceed "too far into siting and design."[640] Issues that should be considered during the environmental screening process include existing and historic habitats and land uses in the proposed construction area, endangered species impacts, wetland disturbances, water quality degradation from erosion and sedimentation, hazardous materials, and historic and archeological resources impacts.[641] This screening should include an analysis of environmental permits that may be required by federal, state, or local agencies.[642] These permits could include CWA permits, dust permits under the CAA, and species take/predation permits under ESA and the Migratory Bird Treaty Act.

Where airport land is to be leased to a private entity for a 15- to 25-year period for ownership and operation of a solar facility (a nonaeronautical use), consultation with FAA is required. According to FAA, airports sponsoring solar PV projects in Bakersfield, Denver, Fresno, and Oakland submitted documentation to FAA describing, among other items, the airport's obligations related to the land, based on how it was acquired (e.g., purchase or surplus federal property); the type of land release request; the justification for release; a demonstration that the airport will obtain fair market value in return for the release; and a description of how revenue generated by the release will be used.[643]

A lease agreement the City and County of Denver have used with private developers of solar-generating facilities offers an excellent example of some of the issues that warrant consideration during the leasing process for solar projects, particularly solar PV projects.[644] First, the agreement provides that FAA's approval of plans is a condition precedent to the effectiveness of the lease.[645] Denver also reserves the right to terminate the lease for aviation purposes upon 6 months' prior written notice and payment of a specified termination value or through provision of an alternate site and a relocation reimbursement.[646] The lease provides the City and County of Denver the option of purchasing the solar system for either fair market value or for a specified buy-out price. The City charges the tenant ground rent for use of the land and in exchange agrees to purchase the energy output of the generating facility at the purchase price specified in a PPA.[647] The tenant is responsible for the costs of construction and all environmental requirements, such as air quality or clean water permitting, as well as control of soil erosion and sediment, solid and hazardous wastes, and noise and vibration.[648]

Where solar projects at airports produce a new "footprint"—i.e., are not located on an existing structure—and in some cases where they significantly increase heights of existing structures, the airport sponsor will need to revise its ALP and obtain FAA approval for these changes.[649] Where ALP changes were needed for FAA-approved solar projects in Bakersfield, Denver, Fresno, and Oakland, sponsors submitted a request to change the ALP to the relevant Airports District Office. On-airport projects must comply with the airport design standards addressed in Section III.F. For example, FAA generally recommends that solar projects not be sited within the Runway Protection Zone and advises that solar projects cannot be sited within an Obstacle Free Zone, a Runway Safety Area, a Taxiway Object Free Area, or a Taxiway Safety Area.[650] Rather, FAA advises that airports consider locating on-airport solar installations in spaces such as noise buffers, flat areas near runways, or on top of hangars or parking facilities.[651]

FAA reviews solar projects at and near airports to ensure that they do not negatively impact airspace safety. Airport developers of solar projects near airports will often be required to submit a Notice of Proposed Construction Form 7460 to FAA.[652] Off-airport project developers, which may include airport operators, private developers, or state or local government agencies, can also trigger FAA review. According to FAA, two indicators of FAA interest include proximity to the airport and proposed use of concentrated solar power technology.[653] Concentrated solar technology creates greater concerns for aviation safety because it involves concentration and reflection of solar radiation in a way that can cause serious glare concerns for pilots.

Solar installations will be presumed hazardous where the project height penetrates critical airspace imaginary surfaces, its design or orientation causes reflectivity concerns, or the project interferes with communication systems.[654] At a minimum, airports or private developers seeking FAA approval for solar projects

[639] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 26.

[640] *Id.* at 31.

[641] *Id.* at 26.

[642] *See* §§ III.J and III.K of this digest.

[643] *Id.* at 30. *See* §§ III.C and III.F.

[644] *Id.* at C-7.

[645] Ground Lease Agreement Between City and County of Denver and XYZ Solar 1-2, *reprinted in* FEDERAL AVIATION ADMINISTRATION, TECHNICAL GUIDANCE FOR EVALUATING SELECTED SOLAR TECHNOLOGIES ON AIRPORTS C-7 (2010).

[646] Solar 5, *Id.* at C-9.

[647] Solar 6–7, *Id.*

[648] Solar 8–10, *Id.* at C-9.

[649] FEDERAL AVIATION ADMINISTRATION, *supra* note 239, at 29.

[650] *Id.* at 26.

[651] *Id.* at 25.

[652] *Id.* at 34-4.

[653] *Id.* at 45.

[654] *Id.* at 26.

must demonstrate that their project avoids these hazards. Detailed methodologies for assessing reflectivity and communications systems interference are available in FAA's 2010 Technical Guidance for Evaluating Selected Solar Technologies On Airports. FAA's review will result in a determination regarding whether the proposed project is an airport hazard; as of 2010, airport sponsors of existing solar projects that had undergone Part 77 FAA review all received "No Hazard Determinations."[655]

b. NEPA Review.—FAA's decision to authorize the release or lease of airport property for solar installations, to authorize a change to an airport ALP, or to allow the lease of an airport roof to a private third party may constitute major federal actions triggering NEPA review.[656] Where projects on or off the airport constitute a major federal action, and are not located on a building or on a small area of disturbed land, an environmental assessment may be required.[657] The FAA has previously authorized categorical exclusions for solar PV projects at airports, including Denver International, Fresno–Yosemite International, and Bakersfield. FAA also is considering development of a new categorical exclusion for small solar energy projects at or near airports.[658]

Categorical exclusions are not available where a project's actual environmental impacts are significant, and thus some mitigation efforts may still be required. The Denver International Airport's Pena Boulevard Solar Project undertook a number of measures to avoid environmental impacts that might have otherwise subjected its solar development to an EA, including the establishment of a still-active erosion control and revegetation program and the installation of a connecting cable by directional drilling underneath a wetland rather than by traditional trenching, which would have affected wetland.[659]

c. Federal Funding.—Airports may also be able to take advantage of VALE funding for solar projects, provided that proposed projects meet all AIP and VALE requirements, are entirely airport-owned, and do not have private investors or partners. For solar PV projects, sponsors may have a stronger case for funding if they use earned RECs to secure airport utility rate reductions rather than offer RECs for sale on the open market, and if they work with local air quality agencies to secure AERCs.[660]

d. Utilities Law Considerations for Solar PV Projects.—As mentioned above, solar PV projects have an additional layer of complication that solar thermal projects do not. Because solar PV projects generate electricity, they will often be affected by federal and state utilities laws, and this regulation may affect their economic viability.[661] For example, Denver International Airport's first solar project on airport property was funded in part by the local utility, which agreed to purchase RECs generated by the project in order to comply with Colorado's renewable energy portfolio standard.[662] This financing allowed the airport and the developer to enter into a 15-year fixed-price PPA at no up-front cost to the airport. The developer secured exclusive rights to the RECs generated by the project, and the City and County of Denver agreed not to undertake any action that could impair or jeopardize the sale of RECs or the generation of renewable energy at the site, "except as required by the Federal Aviation Administration or as required for air navigation purposes."[663] Additionally, Denver's PPA arranges for title of the facility for the purposes of income tax purposes related to tax benefits and depreciation.[664] State and federal tax incentives and liabilities may affect project economics, and should be thoroughly researched prior to project development.

3. Install Building-Mounted Wind Turbines (ACRP 02-10 RE-09) and On- or Off-Airport Wind Turbines

Wind power can also reduce emissions from electricity generation. Each megawatt-hour of wind generation can displace approximately 1,200 lb of CO_2 emissions.[665] However, wind power raises more questions than solar about compatibility with airport operations, because larger wind turbines often involve greater heights and can interfere with radar signals. These concerns are greatest with the large, utility-scale wind turbines that can be hundreds of feet tall and have rotor-blade diameters comparable to the wingspan of large jets.

Proposals to install wind turbines on and near airport property would be subject to an FAA review process similar to that required for solar projects. A critical part of the analysis for wind-related projects is the process of assessing the potential airport hazards of on-airport or off-airport projects.[666] Some (but not all) wind turbines in some environments have been shown to pose airport hazards due to height or effects on airport radar systems.

Under C.F.R. Part 77, any person or entity that intends to sponsor one of the following types of projects must first notify FAA:

- Any construction or alteration exceeding 200 feet above ground level.

[655] *Id.* at 35.

[656] *Id.* at 31, 42. *See* §§ III.F and III.J.

[657] *Id.* at 26.

[658] *Id.* at 42.

[659] *Id.* at 44.

[660] *Id.* at 69. *See* § III.D.3.

[661] *See* § III.H.

[662] *Id.* at 35.

[663] Solar Power Purchase Agreement Between the City and County of Denver and XYZ Solar 7, *reprinted in* FEDERAL AVIATION ADMINISTRATION, TECHNICAL GUIDANCE FOR EVALUATING SELECTED SOLAR TECHNOLOGIES ON AIRPORTS D-9 (2010).

[664] Solar 9, *reprinted in id.* at D-11.

[665] American Wind Energy Association, Wind Power and Climate Change, http://www.awea.org/_cs_upload/learnabout/publications/4136_1.pdf.

[666] *See* § III.F.

- Any construction or alteration:
  - within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet,
  - within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet,
  - within 5,000 feet of a public-use heliport which exceeds a 25:1 surface.
- Any construction or alteration located on a public use airport or heliport regardless of height or location; or
- When requested by FAA.[667]

Submission to FAA of a Form 7460-1 is required for these proposed constructions or alterations; where construction occurs off airport, submission of a Form 7460-2 will also be required.[668] As part of this process, the effect of the height on aircraft operations and the potential effects of rotors on radar and other airport-related electronics are considered.

One significant environmental concern related to wind turbines is the impact of rotating blades on birds and bats.[669] Adverse impacts to avian wildlife vary geographically within the United States, with Appalachia and California arising as particular areas of concern.[670] The Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the ESA may affect wind turbines or related construction work through their restrictions on the harming or taking of endangered or migratory bird species and eagles.[671]

These laws can create liability for persons that directly harm bird species or, in the case of the ESA, the habitat for the species.[672] State wildlife laws can also be relevant where they provide additional protections beyond federal law. At least one federal court has enjoined a wind project because of its adverse impacts on the endangered Indiana Bat.[673] Voluntary consultation with Fish and Wildlife Services, the agency that enforces each of these three laws, and state wildlife agencies early in the project development process can help resolve adverse impacts to wildlife.[674]

a. On-Airport Wind Turbines.—Because they are generally small in scale, on-airport wind projects are generally unlikely to raise major concerns. For example, the Massachusetts Port Authority recently installed 20 building-integrated wind turbines as part of a demonstration project at Boston's Logan Airport.[675] The project is expected to meet approximately 2 percent of the building's monthly energy use—generating about 100 megawatt-hours annually. Hawaii's Honolulu International Airport has a similar pilot project with 16 building-integrated wind turbines.[676] These projects created little concern, relative to large-scale projects elsewhere, because of their lower profiles, both in terms of height and visibility on radar.

Airports considering small-scale, on-site, wind turbines should keep in mind the general considerations presented above, such as whether local codes would affect turbine height or safety requirements.

b. Off-Airport Wind Turbines.—Off-airport wind turbines can raise a number of unique safety issues for airports, pilots, and air passengers. Some airports have identified concerns about and even brought legal challenges against a number of off-airport wind projects across the country. For example, in 2008, Clark County, Nevada, challenged a set of FAA No Hazard Determinations for 83 wind turbines of up to 400 ft in height near a proposed airport site near Las Vegas.[677] Clark County argued that the FAA's no hazard determinations failed to give adequate consideration to the potential hazards that wind turbines would present to air navigation at the new airport. Clark County's concerns related primarily to penetration of the departure slope for aircraft leaving the proposed aircraft and interference with air traffic control radar systems.[678] Either of these effects could have reduced capacity to handle air traffic safely at the proposed airport. The U.S. Court of Appeals ruled in Clark County's favor, finding that the FAA had

[667] FAA, Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) (citing 14 C.F.R. Pt. 77.9), *available at* https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

[668] *Id.*

[669] *See* U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-05-906, WIND POWER: IMPACTS ON WILDLIFE AND GOVERNMENT RESPONSIBILITIES FOR REGULATING DEVELOPMENT AND PROTECTING WILDLIFE 1 (2005), *available at* http://www.gao.gov/new.items/d05906.pdf. *See* § III.K.

[670] *Id.* at 10–11 (2005).

[671] 16 U.S.C. §§ 703–712 (2006); 16 U.S.C. §§ 668–668d (2006); 16 U.S.C. §§ 1531–1544 (2006).

[672] U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 669, at 4.

[673] Animal Welfare Institute v. Beech Ridge Energy, LLC, 675 F. Supp. 2d 540 (D. Md. 2009).

[674] Ironically, airports may need to comply with these laws and avoid impacts to species and habitat at the same time that they work with the same agencies to reduce or eliminate wildlife hazards.

[675] Massport, Massport Takes the Wind out of High Energy Costs: Boston Logan to Receive 20 Building-Integrated Wind Turbines (Mar. 5, 2008), http://www.massport.com/newsroom/News/BostonLogantoReceive20Building-IntegratedWindTurbines.aspx (last visited June 16, 2012).

[676] Curtis Lum, *Wind Backs Up Honolulu Airport*, USA TODAY, Nov. 17, 2009, *available at* http://www.usatoday.com/travel/flights/2009-11-17-honolulu-airport-wind-power_N.htm.

[677] Clark County v. FAA, 522 F.3d 437 (D.C. Cir. 2008).

[678] *Id.* at 442. For more information on potential radar hazards posed by wind turbines, *see* EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION, GUIDELINES ON HOW TO ASSESS THE POTENTIAL IMPACTS OF WIND TURBINES ON SURVEILLANCE SENSORS (2009), http://www.apere.org/manager/docnum/doc/doc1289_Guidelines.fiche117.pdf.

failed to adequately consider the effects of the proposed turbines on aviation.[679]

In 2011, the Town of Barnstable, Massachusetts, challenged a set of FAA No Hazard Determinations for 130 off-shore wind turbines, each 440 ft tall, to be located in 25 sq mi of Nantucket Sound.[680] The Town of Barnstable argued that the FAA violated its statutory authority, misread its own regulations, and was arbitrary and capricious in analyzing the danger that the wind turbines posed to aviation.[681] The FAA argued that the Town lacked standing to challenge the FAA's determinations and that the claims were faulty on the merits.[682] The D.C. Circuit Court of Appeals ruled for the Town of Barnstable. The court held that the FAA had improperly applied its own guidelines when making the No Hazard Determinations.[683]

In other contexts, the FAA has also acknowledged concerns relating to the installation of wind turbines near airports. An FAA official recently testified before Congress regarding the need to undertake careful analyses of the impact of wind energy projects on radar facilities. [684] Additionally, in 2006, FAA issued a Determination of Hazard to Air Navigation for a proposed wind turbine in Boston, Massachusetts, about 3 mi southeast of Logan International Airport.[685] There, the FAA found that the proposed wind energy project would require restrictions on runways under development, affect visual approaches to the airport, and likely create false radar targets.[686] These combined effects of construction would have "a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft and on air navigation facility(ies)."[687] In addition, the placement of wind projects in or near regularly used flight paths can disrupt air navigation by commercial and general aviation air traffic.[688]

Nonetheless, no individual wind project will necessarily be detrimental to an airport, aviation, or nearby wildlife. A number of airports have had wind generation projects located near their property without impacts to aviation safety. Case-by-case mitigation efforts, such as siting turbines out of the line-of-sight of existing radar systems, reducing turbine density and height, updating ground-based navigation systems, or installing radar absorbing stealth coatings on wind turbine blades might, under some circumstances, reduce hazard concerns so that wind projects may coexist with airports.[689]

For example, in a No Hazard Determination for wind turbines in Anchorage, Alaska, near the Ted Stevens Anchorage International Airport, the FAA identified 22 of the original 33 wind turbines as Part 77 obstructions that would create significant electromagnetic interference impacts on the airport's navigational facility and surveillance radar systems.[690] Replacement of the radar system with a newer system reduced the number of interfering wind turbines to 12, all of which were permanently abandoned to avoid the electromagnetic interference.[691] FAA's No Hazard determination was limited to an assumption that the height of any of the remaining 21 wind turbines would be 600 ft above mean sea level and found that exceeding this height "will create significant adverse impact to the ANC Category III Instrument Landing System and would present an immediate Hazard condition that will negate the entire FAA Determination" for the project.[692]

L. Refrigerants

Refrigerants are often potent GHGs and are most commonly used in air conditioning, refrigerator, and freezer applications. Airports use refrigerants for heating and cooling systems, food service refrigerators, and to provide preconditioned air to aircraft.

Over the last several decades, refrigerants garnered international attention for their contribution to stratospheric ozone depletion. With the phaseout of many ozone-depleting refrigerants under the Montreal Protocol, such as chlorofluorocarbons and hydrochlorofluorocarbons, manufacturers and users of refrigerants have been forced to find substitutes. However, some refrigerant substitutes, such as hydrofluorocarbons, have high global warming potential. Hydrofluorocarbons are considered to be GHGs and can have a global warming potential ranging from 140 to 11,700 (compared to CO_2's global warming potential of 1).[693]

[679] Clark County v. FAA, 522 F.3d 437 (2008).

[680] Town of Barnstable v. Fed. Aviation Admin., 659 F.3d 28, 30 (D.C. Cir. 2011).

[681] *Id.* at 31.

[682] *Id.*

[683] *Id.* at 35.

[684] Statement of Nancy Kalinowski, Vice President, Systems Operations Services, Air Traffic Organization, Federal Aviation Administration, before the House Armed Services Committee, Subcommittee on Readiness, on the impact of wind farms on military readiness, June 29, 2010, at 3 (explaining how wind turbines interfere with radar detection), *available at* http://www.faa.gov/news/testimony/news_story.cfm?newsId=11562.

[685] FAA, Aeronautical Study No. 2005-ANE-995-OE, Determination of Hazard to Air Navigation (2006), http://www.masstech.org/Project%20Deliverables/Comm_Wind/Boston_Long%20Island/Boston_Long_Island_FAA_Determination_1.pdf.

[686] *Id.* at 4–5.

[687] *Id.* at 6.

[688] FEDERAL AVIATION ADMINISTRATION, Order JO 7400.2G, PROCEDURES FOR HANDLING AIRSPACE MATTERS §§ 6-2-8 & 6-3-9 (Apr. 10, 2008), http://www.faa.gov/documentLibrary/media/Order/7400.2G.pdf.

[689] Martin LaMonica, *Tech Fixes to Wind Turbine Radar Conflict Face Hurdles*, CNET NEWS (Sept. 6, 2010), http://news.cnet.com/8301-11128_3-20015611-54.html.

[690] Federal Aviation Administration, Aeronautical Study No. 2004-AAL-104-OE, Determination of No Hazard to Air Navigation 4 (2008).

[691] *Id.* at 5, 7.

[692] *Id.* at 7.

[693] U.S. Environmental Protection Agency, High GWP Gases and Climate Change (2010), http://www.epa.gov/highgwp1/scientific.html (last visited June 16, 2012).

1. Replace Refrigerants with Natural or Lower Global Warming Potential Gases, Incorporate Intelligent Fault Diagnosis for HVAC Refrigerant Systems, and Install Microchannel Components and Heat Exchangers (ACRP 56 RF-01, RF-02, RF-04)

Airports can reduce hydrofluorocarbon emissions by retrofitting or replacing systems to use alternative refrigerants that have lower global warming potential. It is of note that under the Montreal Protocol, designed to protect the stratospheric ozone layer, hydrofluorocarbons will be virtually phased out by 2020, after which they can no longer be manufactured.[694]

Airports can also reduce the GHG impact of refrigerants by preventing equipment leaks and recovering refrigerants when no longer in use to prevent their release into the ambient air.[695] For example, airports might consider incorporating intelligent fault diagnosis for HVAC refrigerant systems, which allows for more effective detection of leaks. Such real-time performance monitoring can be particularly helpful in the detection of slow leaks, which are difficult to detect with conventional refrigerant sensors. Airports can also reduce the amount of refrigerant that is needed in a heating and cooling system by installing components such as microchannel components and multilouver fin heat exchangers. These technologies can replace older, less efficient technology—this added efficiency contributes to reducing GHG emissions. Additionally, these components are smaller than conventional components, and they require less refrigerant.

ACRP 56 ranks three measures from the refrigerant category in its top 20 GHG reduction measures. These measures aim to replace higher global warming potential refrigerants with lower global warming potential refrigerants, to monitor refrigerants to prevent leaks into the ambient air, and to reduce the need for refrigerants generally. As discussed in Section III.A.5., the CAA regulates many refrigerants, fire control substances, and other chemicals that can deplete stratospheric ozone. Specifically, it places certain restrictions on the use of refrigerants in stationary sources and motor vehicles.[696]

Because airports already face a number of mandatory duties associated with refrigerants, sponsors that take steps beyond these duties may be able to generate GHG reduction credits for the airport. Additionally, airports seeking to reduce GHGs through altering the use or monitoring of refrigerants should also consider whether the costs of implementing such changes will implicate any FAA grant assurances. In particular, Grant Assurance 24, discussed in Section III.C.4, requires that airport owners or operators maintain a schedule of charges that will make the airport as self-sustaining as possible, given the circumstances. Airports probably cannot spend disproportionate resources for a small gain for the airport, especially if airlines or other users challenge such spending.

V. CONCLUSION

This digest identifies a range of GHG-mitigation measures being implemented and considered by airports and provides an introduction to the legal issues surrounding them. Three general observations may be drawn from the digest.

First, the existing regulatory environment is complex and is complicated by several layers of preemption under multiple federal statutes and the many requirements of federal sponsor grant assurances and other regulations. Aviation rules were generally produced without contemplation of GHG-related issues, and there is currently little in the way of federal and state guidance to advise airports specifically considering GHG reductions.

Second, the overlay of state and local authority can create further legal considerations for airports seeking to reduce their GHG emissions, particularly where an action implicates areas of traditional state or local control such as utility regulation, zoning, or building and safety codes. A comprehensive examination of each of these measures in all of the states and localities is beyond the scope of this digest, but Sections III.G through III.K highlight some of the important areas for airports to investigate during project development.

Third, state and federal laws and regulations relating to the direct control of GHG emissions are continually evolving, and there is considerable uncertainty about the scope of potential controls and whether and how they will apply to airports or the aviation sector. Airports will need to ensure that they continue to follow these developments, as well as those of state and local jurisdictions.

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[694] U.S. Environmental Protection Agency, What You Should Know about Refrigerants When Purchasing or Repairing a Residential A/C System or Heat Pump (2010), http://www.epa.gov/ozone/title6/phaseout/22phaseout.html (last visited June 16, 2012).

[695] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FOURTH ASSESSMENT REPORT: CLIMATE CHANGE 2007, 6.4.15 (2007), *available at* http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch6s6-4-15.html.

[696] 42 U.S.C. § 7671g.

TABLE OF ACRONYMS

ACRP	Airport Cooperative Research Program
AEPS	Alternative Energy Portfolio Standards
AERC	Airport Emissions Reduction Credit
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ANCA	Airport Noise and Capacity Act
APU	Auxiliary power unit
BART	Bay Area Rapid Transit
CAA	Clean Air Act
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CEQA	California's Environmental Quality Act
CNG	Compressed natural gas
CO_2	Carbon dioxide
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAAA Act	Federal Aviation Administration Authorization Act
FBO	Fixed-base operator
FERC	Federal Energy Regulatory Commission
GAO	Government Accountability Office
GHG	Greenhouse gas
GSE	Ground Service Equipment
HVAC	Heating, ventilation, and air conditioning
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
MEPA	Massachusetts Environmental Policy Act
mi/gal	Miles per gallon
MT CO_2e	Metric tons of CO_2 equivalent
NEPA	National Environmental Policy Act
PFC	Passenger facility charge
PPA	Power purchase agreement
PURPA	Public Utility Regulatory Policies Act of 1978
PV	Photovoltaic
REC	Renewable energy credit
RPS	Renewable portfolio standards
SEPA	Washington State Environmental Policy Act
SEQRA	New York State's State Environmental Quality Review Act
VALE	Voluntary Airport Low Emissions program

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