

## As Airports Rush To Electrify, Important Questions Remain Unanswered, And Unasked

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**Daniel Markind**

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Daniel B. Markind is a Forbes.com energy column contributor. The views expressed in this article are not to be associated with the views of Flaster Greenberg PC.

As with many other industries, the airport industry is rushing to electrify. Nearly every airport conference contains a session on airport electrification. As nearly every commercial service airport in the United States is owned by public entities in some fashion, there also is political pressure on airport administrators to limit their use of fossil fuels in everything from their rental car facilities to new or expanded terminals and the vendors who lease space in them to making room for electric airplanes.

Unfortunately, the enthusiasm often runs away from the science. As many, if not most, new airport expansion and renovation projects include some substantial component consisting of renewable energy as well as electrification of the energy mix, it is imperative on airport executives to plan for the truth about energy availability and reliability. It serves no one's purposes to try to score political points by claiming how clean and green this new terminal is or that rental car facility will be when the reality is that we are still far away from being able to match clean energy availability to the locations that it is now and will be increasingly needed in the future. While we don't have clear answers to many of the questions being asked, it is the questions not being asked that really should concern us.

Start with this. Despite the huge enthusiasm about new electric-powered airplanes that are being developed, the possibility that electric aircraft will replace jet fueled aircraft in the near future is practically zero. The reason is a matter of simple physics, and not public policy, as it is dependent on the size and weight of the battery that would need to be carried on an electric-powered airplane that is designed to cover any substantial distance. Specifically, as the amount of energy needed to fly from place to place increases with the distance to be flown, the size and weight of the battery needed to store such energy must also increase. Meanwhile, as the size and weight of the battery increases, the amount of energy needed to get the plane airborne and keep it flying also increases. Thus, a vicious circle exists that must be broken in order to make electric flight – especially long distance flying – a physical (not to mention economic) reality. For short haul flights - say for example 300 miles – it is possible to imagine electric aircraft making serious inroads in the near future. However, no one should expect to be flying on an electric plane from New York to Los Angeles any time soon. It likely will be decades before that can happen, if the physical limitations on battery size and weight for electrical storage can be overcome at all.

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In terms of powering new terminals, airports not only are seeking to protect the environment by adding renewable energy to the power mix, but they are also under great political pressure to do so. Following the lead of Pittsburgh International Airport, airports seeking to expand existing terminals or construct new terminals are exploring establishing electrically powered micro-grids, where the entire power supply to the airport is self-contained. Unlike Pittsburgh, however, which both possesses and relies on natural gas located directly on its airport property that is obtained by hydraulic fracturing, most airports don't possess such largesse, and are attempting to power themselves and their new additions by adding large amounts of solar panels or other renewable fuels to produce electricity.

It is here that the airports must be especially careful. The energy sector is one in which much that is written is long on wishful thinking and short on reality. Many renewable sources remain intermittent, and power storage capability either remains unavailable or is not yet scientifically feasible. While Pittsburgh can power itself using its own energy sources, other airports that attempt to do this using solely renewable sources have had trouble keeping the lights on into the afternoon, or even keeping parking garages working. Further, without reliable landing lights, night flights likely would have to be cancelled, or at least curtailed. Also, an air traffic control system that no longer has enough electricity to power itself constantly and not intermittently would be useless, not to mention incredibly dangerous. Until there is a clear way to obtain and preserve power to be used on a 24/7 basis, relying primarily on energy from renewable sources appears quite problematic for most airports.

If forced to rely on the local power utility – which nearly every airport running its own micro-grid would effectively be – airports first need to know that such a utility would have enough capacity to supply the airport on a constant basis. A facility drawing more power for aviation fuel, electric rental cars, and all other new uses such as are now being contemplated as electrification becomes ever more widespread would require an enormous influx of additional electricity. Where would this new power come from? Many existing utilities simply can't provide that quantity. If they can, it may require pulling supply from other areas. There are few surer ways for airports to endure the wrath of the local community than to be the cause of rolling brown-outs in the surrounding area as the utility serves the airport's needs above those of other customers.

Finally, the question that perhaps should be asked first appears not to be asked at all. What is the purpose of the electrification? Undoubtedly, the answer is to protect the environment, but this misses the most important point. How is that electricity to be produced?

We don't use kites and keys. Electricity gets produced primarily in power plants, and the key element there is the input. In many states, especially in the Midwest, coal remains the primary source of fuel producing electricity. Any switch to electricity and away from jet fuel for planes or gasoline for rental cars in states like Indiana and Wisconsin actually may hurt the environment instead of helping it, at least until new environmentally friendly sources of supply match up with the increased demand. Is this what we want? Long term electrification may make sense, but if our goal is to make a difference now this would be going in the opposite direction. We need to take care that our policies encouraging the increased use of electricity are, in fact, consistent with our ability to produce all of this new energy via environmentally friendly energy production technologies.

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For the long term health of the planet then, moving toward cleaner sources of energy is very important. In the short run, however, the rush to electrify is fraught with problems. Before airports rush headfirst into this process, it would be wise to ask, first, if this actually will help the environment given the current and projected new power sources that will be generating the electricity, second, whether there will be sufficient electricity to provide the power the airport once all of these new electrical uses and needs have been implemented, and, third, if the power would be reliable at all times that it is needed. Unless the answer is yes to all three, it might be better to prepare for that day yet not rush to implement a premature solution too quickly that may only make the problem worse before it gets better.

**ATTORNEYS MENTIONED**

Daniel Markind