Boeing Freezes Design With Liquid Natural Gas-Powered Airliner

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Image: Boeing/NASA

The next great evolution in airline efficiency could come in the form of liquid natural gas. Boeing recently submitted a proposal to NASA as part of an ongoing effort by several airplane manufacturers to imagine what might be possible in the next generation of airliners, and the use of LNG may be an attractive alternative to traditional fuel thanks to its lower emissions, cost and higher availability.

Boeing's proposal is a stretched version of an efficient airliner design the company submitted to NASA in 2010 as part of the Subsonic Ultra Green Aircraft Research project (yes, SUGAR). At the time the focus was on an efficient wing mounted higher on the fuselage and fitted with advanced engines, but the concept still used traditional jet fuel. Other participants included MIT's 'double bubble' design with an equally sleek and efficient wing.
For its latest project, Boeing stretched the fuselage to make room for a pair of LNG tanks: one in the tail and one near the nose. Because of the very cool temperatures needed to store liquid natural gas, Boeing is calling the latest project SUGAR Freeze. In 2010 NASA was pushing companies for designs that could reduce fuel burn by 60 percent compared to a typical 737-800 used today. Using LNG, Boeing believes it can get the SUGAR design to 57 percent, and using open propeller, unducted fan jet engines the company thinks it could achieve a 62 percent boost according to *Aviation Week and Space Technology*.

Not afraid to push things a step further, Boeing also included SUGAR designs with both fuel cell and battery powered electric motors to further boost efficiency.

While these efforts look good on paper – or more accurately, hard drives – at this point the widespread adoption of natural gas in aviation has several hurdles to overcome. Both safety and design
issues mean that the technology wouldn't be ready until 2040 or 2050, at the earliest.

It will still require a big appetite for both risk and imagination, something that's been decidedly lacking in the past few decades. Since the introduction of the first jet airliners in the 1950s, little has changed in the basic design. Most of the efficiency gains have been made with incremental improvements in aerodynamics and engine design.

Getting an LNG powered airplane, a double bubble or a blended wing body will be a massive challenge for companies like Boeing, requiring the proper balance of risk and reward to produce the next revolutionary airliner rather than another 30 years of gradual evolution