



4560 Sideline 22, R.R. #5, Claremont ON L1Y 1A2 / landoverlanding@gmail.com / 905-649-2433

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Dear Mayor Collier,

On behalf of the Land Over Landings research team, I am pleased to provide you with the additional data you requested following Sari Saredidine's delegation to the Regional Council meeting on January 29.

The delegation had to do with the Region's Climate Change Emergency Declaration, and you had a question related to the following paragraph of Sari's presentation:

The Declaration states that "climate change considerations will be embedded across all elements of Region business." Excellent! That commitment bodes well for the health of North Pickering, because the aerotropolis idea – if the federal government ever approved such a plan – would fail every test. North Pickering's farmland, on the other hand, would contribute in direct, crucial ways to the Region's mitigation and resiliency efforts.

You asked if we had data to back up the statement: "(in your words) *if this was put to the test it would fail every time.*" The tests in question would be those the Region applied in conformance with its commitment to view all Region business through the lens of climate change. Climate change considerations would extend to any infrastructure proposal, such as an airport, that could add new emissions to the Region's tally – and on the Federal Lands that would mean megatonnes of emissions where there are very few emissions today. As a councillor noted later in the meeting, Durham Region has relatively low emissions compared with jurisdictions such as Toronto and Hamilton. But as Mayor Mitchell pointed out, all emissions add to the global total. Durham Region's low numbers mean we are starting with a major advantage and less-onerous challenges; why would we knowingly squander that advantage by adding infrastructure that would increase our emissions to levels rivalling Hamilton's?

Those climate-related litmus tests were not specifically referring to indoor agricultural activities within the boundaries or confines of an airport. You were presumably referring to vertical farming when you asked for data backing up our assertions there. *A Future for the Lands*, the agricultural economics study commissioned by Land Over Landings, and released in 2018, did not cover vertical farms (your recollection was accurate). It didn't even cover greenhouses. As the consultants (both of them agricultural economists) said in their report:

Not included in this vision are a few types of agricultural production such as greenhouse vegetable production since there are existing clusters in other regions of the province (e.g., Leamington) that will have a competitive advantage over such production on the Subject Lands.

The consultants could see no secure future for large-scale greenhouse operations on the Lands, in large part (but not exclusively) because of the high energy demands of such operations, which would frustrate their

ability to compete. And indoor farms are even greater energy hogs than greenhouses. The consultants' thinking has been backed up by many other studies and by the experiences of many Canadian growers (some random samples: in Ontario, Mucci Farms, NatureFresh Farms, Mastronardi Farms, Bruce Tropical Produce; in Quebec, Les Serres Lefort, Les Serres Stéphane Bertrand...). The verticalfarming.com website, reporting on a study done for a firm in British Columbia, is a good source of details on the sector's inherent complexities, constraints, and risk factors.

There is also the study by Theurl et al.,¹ which was selected as an illustrative example by the Intergovernmental Panel on Climate Change for its *Special Report: Climate Change and Land* (2019). As you know, the Panel assesses the peer-reviewed, scientific, technical, and socio-economic data in thousands of journals and other published materials from around the world, and includes in its reports only those findings backed by broad or overwhelming consensus. The illustrative examples the Panel chooses to use carry the same weight of authority as the text around them. The IPCC referenced Theurl's study in the *Special Report's* Chapter 5: Food Security (p. 491), and noted:

[...] environmental benefits associated with local food can be offset by inefficient production systems with high emission intensity and resource needs [...]

Theurl's findings were behind the following comments in Sari's presentation:

Research shows that local vegetables grown in a greenhouse have GHG emissions **10 times higher** than those grown in a farm field. Even in cold weather months, the GHG emissions from indoor-grown vegetables remain **substantially higher** than those of their imported, field-grown counterparts.

Greenhouse/indoor growers face real hurdles in areas such as North Pickering. Not only would their produce likely be more expensive, *even against imports*, owing to higher production costs, but the operations' emissions would also be higher than those of field crops. The IPCC report's authors went on to say:

For example, vegetables produced in open fields can have much lower GHG emissions than locally produced vegetables from heated greenhouses (Theurl et al. 2014). Whether locally grown food has a lower carbon footprint depends on the on-farm emissions intensity as well as the transport emissions. In some cases, imported food may have a lower carbon footprint than locally grown food because some distant countries can produce food at much lower emissions intensity.

Land Over Landings is in the final stages of producing a research paper on the topic of indoor farming. We will make sure you receive a copy once it has been published.

We are pleased and relieved that the Climate Change Emergency Declaration passed unamended, and we truly thank you for voting for it.

Sincerely,



Pat Valentine, Communications Director
Land Over Landings

1. M.C. Theurl et al., "Contrasted greenhouse gas emissions from local versus long-range tomato production," *Agronomy for Sustainable Development*, 34(3), July 2013. Accessible at: https://www.researchgate.net/publication/256503477_Contrasted_greenhouse_gas_emissions_from_local_versus_long-range_tomato_production