

An Incremental Approach to Cleaner Transit

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IT'S 2020 AND CANADIANS WANT TO REDUCE THEIR CARBON FOOTPRINT

The transportation sector is the second largest source of greenhouse gas emissions in Canada, responsible for a quarter of all emissions.¹ Transit has a role to play in improving this record and helping Canada meet its climate change commitments. Canadian municipalities are already onboard: some have deadlines to phase out diesel buses, while others are considering next steps.

ELECTRIC BUSES ARE INCREASINGLY REPLACING DIESEL

They're a tried and true technology in Asia, Europe and the U.S., and are being tested in transit systems across Canada. They provide a reliable, cleaner form of transportation. Customers love their smooth ride. They're quiet and pollute less. And with drastically reduced fuel costs, regenerative braking and fewer moving parts, they're 41 to 44 per cent cheaper to operate than diesel.² It's no wonder many municipalities, provinces and the federal government see electric buses as the way of the future and are beginning to set incentives, targets and timelines for introducing zero-emission propulsion systems for transit.

THE LEARNING CURVE TO GOING GREEN

Although the benefits are compelling, there are challenges that can hamper a transit system's schedule to go green.

When deciding to electrify, transit systems not only have to choose the vehicle, but also work out the complexities of charging and related infrastructure. Needing to recharge vehicles complicates service planning, especially when recharging requirements are affected by range, battery specifications, weather, temperature and passenger load.

The more experience Canadian systems get with electric, the more learning everyone will be able to draw on. The most notable initiative, the Pan-Canadian Electric Bus Demonstration and Integration Trial is being spearheaded by the Canadian Urban Transit Research and Innovation Consortium (CUTRIC) in Vancouver, Brampton and York Region. Charging station and transit bus manufacturers have cooperated to develop interoperable bus and charging infrastructure technology. It's a world-first happening here in Canada, and the results are expected to become a standard.

THE WAIT TO GO GREEN

In the short term, Canadian municipalities must contend with a limited availability of new electric vehicles. With few North American suppliers, current procurement lead-times for zero-emission vehicles may be up to 24 months.

No system wants to go through the inevitable (and likely very public) political, budgetary and staff efforts involved in approving such a major change, only to find their green aspirations may have to be put on hold.

REPOWERING: REDUCE, REUSE, RECYCLE

There is another approach, which brings with it all the benefits of going green while mitigating the challenges. That is to take a still-usable diesel bus, repower it with a clean propulsion system, refurbish the vehicle overall so it's essentially like new, and get it on the road in a pilot project to test out charging and service planning requirements. This can be done in about a quarter of the time and about half the cost of procuring a new zero-emission vehicle.

The repowering concept is already a reality in other countries and is now being introduced to Canada. MTB Transit Solutions, a long-standing Milton, Ontario-based bus fleet repair and

refurbishment company, is launching a new service to repower diesel buses. Through MTB's ZEV Clean Power initiative, transit systems can start their green transformation sooner, or ramp up their expansion more quickly and more economically.

ALL THE BENEFITS, LESS RISK

Supported by a federal grant and to be tested by independent third parties, ZEV Clean Power technicians have re-engineered a prototype transit vehicle, repowering a transit bus from diesel to electric. With its launch to municipal transit systems this spring, operators can get a zero-emission vehicle on the road, fully repowered and refurbished to OEM specifications within six months.

The repowering approach offers several important advantages to buying new. It involves significantly less up-front cost. Much or all the up-front capital may be recouped through operational savings. Repowering costs approximately half the cost of a new electric bus.

Because of the shorter timelines, communities can get on the road to reduced greenhouse gas emissions sooner. Transit operators won't be throwing out a still-serviceable vehicle body that could have many more miles on it. Fewer used bus parts going into landfill is good for the environment.

INCREMENTAL DEPLOYMENT = LESSONS LEARNED

In addition to the business case benefits, repowering is a lower-risk way for transit systems to get into the green world, one bus at a time. A more gradual introduction allows systems to test and learn about different charging technologies and service planning approaches before committing to a broader implementation. Running limited pilots on specific routes will help identify the impacts and differences of an electric system, enabling operators to make more informed decisions about long-term infrastructure requirements.

There's little debate now that going green is the right thing for Canadian transit systems to do, but as always, the devil is in the details. Repowering offers a sustainable, lower-risk and fiscally responsible way to achieve greenhouse gas emission reduction targets sooner and for less money.

The Power of Repower

	Repower	New Electric Bus
Extends life of bus	✓	✗
Available in 6 months	✓	✗
Less up-front investment	✓	✗
Accelerates fleet conversion	✓	✗

REFERENCES

1. [The time for funding electric buses is now](#), Clean Energy Canada, February 4, 2020.
2. Electric Bus Feasibility Study, Marcon for the City of Edmonton, as quoted in [Will Canada Miss the Bus](#), Clean Energy Canada, March 2019, p. 12.