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UNIVERSITY OF VICTORIA NEWS RELEASE

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All-electric BC transport economical, thanks to low-cost renewables

If all vehicles in British Columbia were powered by electricity instead of liquid fuels by 2055, BC would need to more than double its electricity generation capacity to meet forecasted energy demand—and the move could prove surprisingly cost-effective.

The finding comes from a team of University of Victoria researchers with the Pacific Institute for Climate Solutions (PICS), and will be published in the November issue of [Applied Energy](#).

By 2055, BC will need to increase its electrical production capacity from a 2015 baseline of 15.6 gigawatts (GW) to 23 GW to meet forecast economic and population growth. Factor in all-electric road transportation as well, and up to 60 per cent additional capacity will be needed. This would more than double BC's electricity generation capacity to 37 GW.

Surprisingly, the cost of generating the extra electricity would be relatively cheap.

Crunching the numbers, the team found that the 60 per cent capacity boost for transport would raise the average unit cost of electricity by only nine per cent due to availability of low cost, renewable energy options. Furthermore, the costs would only rise by five per cent if at least half of drivers charged their vehicles at off-peak times. Spreading the demand means less need for capacity build-out.

Co-author Curran Crawford, a member of the PICS Transportation Futures for BC project and a professor with UVic's Institute for Integrated Energy Systems, says low-carbon generation options such as wind and solar power would keep a lid on energy prices. "Our modelling shows that electrification of transport systems, and a significant reduction in greenhouse gas emissions (GHGs), can be achieved at relatively low additional cost to the electricity system," he says.

Under BC's current Clean Energy Act, at least 93 per cent of grid electricity must come from renewable resources such as hydropower, wind or solar. Crawford says as long as that policy remains in place, electrifying the entire road fleet would reduce total emissions from the combined transportation and electricity sectors by 38 per cent (or 260 MtCO₂) between 2015 and 2055, relative to business as usual.

"Transportation is responsible for more than a third of BC's total GHG emissions; the CleanBC plan rightly envisages transitioning BC's cars, SUVs, buses and truck fleets away from fossil fuels to clean electricity, which will make a huge contribution towards meeting provincial GHG reduction targets," says Crawford.

"BC's planned Site C project will provide 1.1 GW, but it just scratches the surface of potential increased power and energy needs, as this research shows. Solar photovoltaic and wind power look very promising for BC due to their falling costs."

In *Electrification of road transportation with utility-controlled charging: A case study for British Columbia with a 93% renewable electricity target*, researchers also noted that regions with a similar hydroelectricity share to BC, such as Quebec, Northern Europe and South America, would likely find similar results in terms of cost-effective electrification of transport.

PICS develops impactful, evidence-based climate change solutions through collaborative partnerships which connect solution seekers with experts from BC's four leading research universities. PICS is hosted and led by

the UVic in collaboration with the University of British Columbia, Simon Fraser University and the University of Northern British Columbia.

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A media kit containing photos is available on [Dropbox](#).

Media contacts:

Robyn Meyer (PICS Senior Communications Officer) at 250-588-4053 or picscomm@uvic.ca

Jennifer Kwan (University Communications + Marketing) at 250-721-7641 or researchcomm@uvic.ca

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