

Robotics team aims to be environmental innovators at Town Hall



Existing infrastructure like lampposts and rooftops should become local hubs of power generation, say students from Équipe Francobotique.

The Aurora-based all-girl First Lego League team, which won the Ontario Championships this past January, were at Town Hall last week to pitch to Mayor and Council a green initiative that clinched them a place at the worlds in Arkansas this Spring.

The idea is simple, but effective: transforming flat rooftops with solar panels and lamp-posts with miniature wind turbines to generate power for electric vehicles (EVs). Solutions like these, they say, will not only make adopting EVs easier, but more environmentally friendly at the same time.

Each year, in addition to the Robot Games, the First Lego League tasks teams with identifying real-world solutions to real-world issues under an umbrella theme ? this year, energy.

?After extensive research on the energy theme, we decided to settle on the following problem: [EVs] can greatly reduce greenhouse gas emissions and help combat global warming but their use will significantly increase our demand for electricity and the environmental benefits depend on sources of electricity,? the team told Council, dressed in their trademark Pikachu hats.

Locally-generated renewables, they said, can power electric vehicles without requiring any ?major? infrastructure changes.

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?Most charging stations are installed where people work, play and live. Since daytime charging aligns with peak solar input and nighttime charging aligns with wind output, our solution seeks to retrofit existing infrastructure near public charging stations with a combination of solar and wind energy generators. Renewable energy will be generated on site and used to charge the vehicles parked there using the EVs themselves as a large collective battery. This will help offset the need for additional energy generation and storage and will prioritize the use of renewable energies.?

In researching their project, the team focused on small-scale generation, with design specifications for each. They visited the Town's

EV charging stations, as well as those in Newmarket, to see opportunities and do comparisons. Eventually, for further research, they picked the parking lot of Upper Canada Mall, with its large roof and number of lampposts, as the ideal location on which to base their model.

“We visited the parking lot to measure using trigonometry the heights of the lampposts and the mall itself. We counted the number of lampposts and estimated the number of solar panels that we could install on the roof, taking into account [safety and setbacks] as well as all the rooftop furniture.”

Completing cost analysis, they presented their solutions to Upper Canada Mall, who greeted their proposals warmly.

“The managers of Upper Canada Mall were particularly interested in our combination of both wind and solar retrofits,” said the team, noting that although the roof might not work for solar panels, the pergola-style solar awning and hybrid lamp posts, may fit the bill.

“We would like to encourage all municipalities, including our own, to consider using existing infrastructure to generate local energy to power public EV charging stations. As our next step we plan to create a green energy retrofit calculator that will allow individuals to input their roof top area and number of lampposts and then obtain a personalized cost, energy and environmental benefit analysis. We were wondering if the Town of Aurora would be interested in collaborating with us on the next step in our innovation project.”

Indeed, Councillors said they wanted to continue the dialogue.

Ward 4 Councillor Michael Thompson congratulated the team on their achievements so far and wished them every success in Arkansas. He opened the door to collaboration, dovetailing with the Town's Economic Development Board, to look into things that can be done within Aurora.

“In the past, we have initiated different applications to develop funds for green initiatives,” he said. “Perhaps there's an opportunity there to look at other ways to use your tremendous talent for the betterment of the community.”

Added Ward 5 Councillor John Gallo: “The missing component of electric vehicles has always been where do you get that energy to recharge them and clearly you've spent a lot of time focusing in on that problem and came up with some wonderful solutions.”

Ward 3 Councillor Wendy Gaertner said she didn't have the words to express her appreciation, but hailed the team “for being our hope for the future.” Mayor Tom Mrakas was also focused on the future.

“From seeing the innovation and what you guys have brought before us, it is quite clear you guys are going to win,” said Mayor Mrakas on their upcoming trip to the United States, to which the Town has sponsored them \$2,500. “We'll continue the conversation to see how we can work with you guys through the Town and implement some of your innovations.”

For more information on the team, visit sites.google.com/view/equipefrancobotique.

To lend your support to their trip to the International Competition, email the team and head coach Renee Northrup at Equipe.Francobotique@gmail.com.