Single-use plastic beverage bottles can be recycled by cutting them into long strips which [can be used any number of ways](https://www.youtube.com/watch?v=GSBh77bjz_Q). Pulling the strips through a heated die [to make them into 3D printer filament](https://www.youtube.com/watch?v=uRQBmAABxKg&t=8s) not only recycles the bottle, but up-cycles it. In the current state of the art this is a manual process whose resulting filament isn’t economically competitive. We envision an automated pultrusion process that accepts unwashed 2-liter bottles and produces quality filament with zero waste products. This is a multi-stage process, including bottle washing, bottle preparation, bottle cutting, strip pultrusion, filament winding, filament splicing, filament packaging and byproduct processing, Every stage is a candidate for automation. The design team will consider all stages and select one or more to advance toward full automation. The team will produce a prototype to demonstrate their technological advance.

Green Ellipsis will donate $1000 to the senior design program for this project. Any funds not used by the design team will be donated to the senior design program. Our in-house FDM 3D printing service will be available to the design team as well.

Green Ellipsis is a small St. Johns County company designing and manufacturing for a sustainable economy, and specializing in additive manufacturing.

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