



Polydiesel®

German Jimenez

Balanced Energy Costa Rica

Bringing down barriers for  
plastics recycling

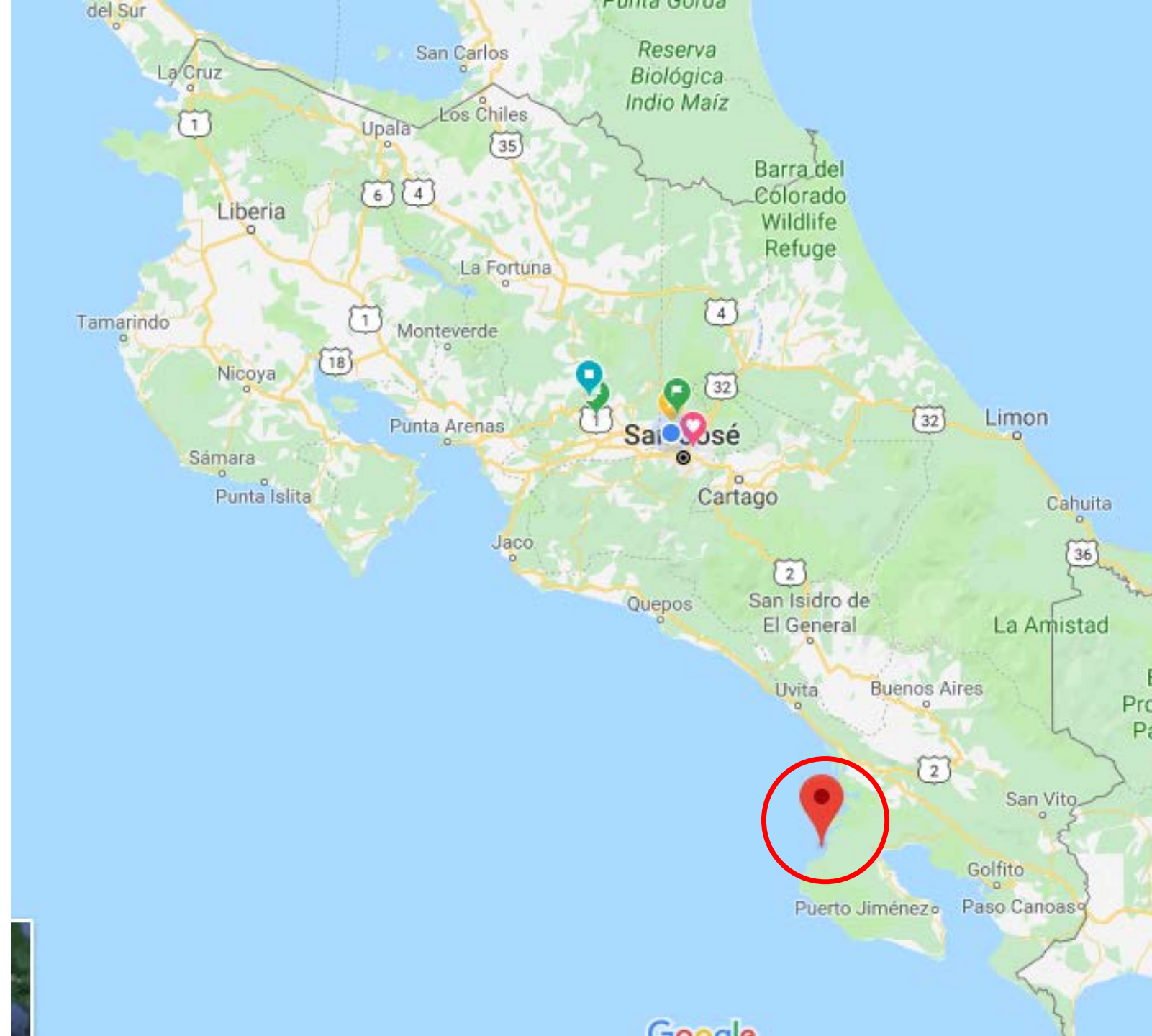
# Drake Bay, Costa Rica

- Small tourist location south of Costa Rica



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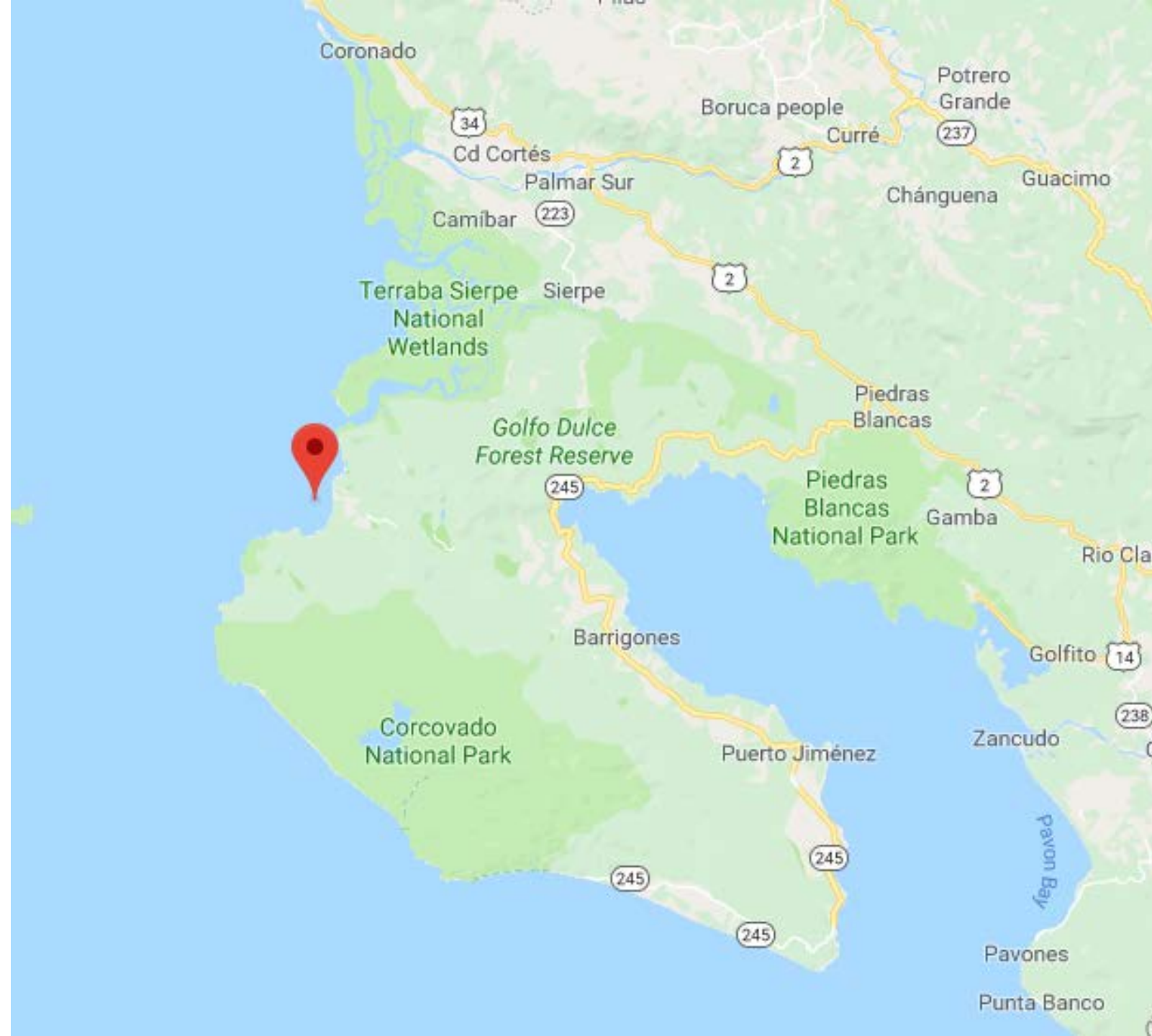
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- No more than 5,000 people live there
- Far from elsewhere, full of nature
- How do we enable plastics recycling there?



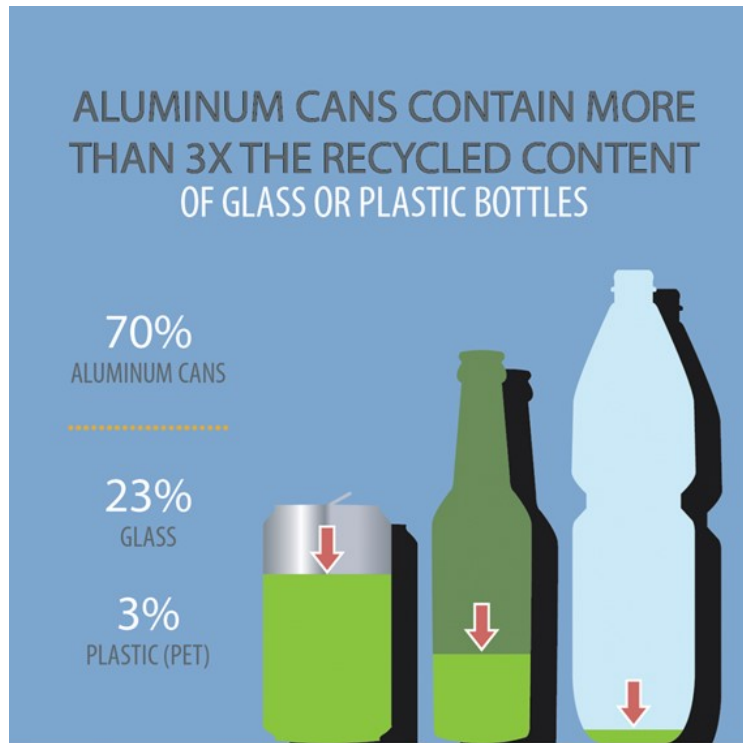


# How much plastic do they have?

- Their population is 1000 persons, with thousands of tourists arriving each year.
- At 40 kg per year per person, the yearly amount of plastic waste generated is ~40 tons. Is it a lot?
- How can we serve such a small, yet committed population?







Average Recycled Content of Beverage Containers	Consumer Recycling Rates of Beverage Containers	Value Per Ton of Recyclable Material
Aluminum 70%	Aluminum 56.7%	Aluminum \$1,491
Plastic (PET) 3%	Plastic (PET) 31.2%	Plastic (PET) \$385
Glass 23%	Glass 34.1%	Glass \$0

Why are aluminum cans recycled properly but plastic isn't?

# Some factors that impact plastic recyclability

Low price for plastic waste

Limited options to recycle mixed plastics – difficulties in separation

Plastic deteriorates (breaks down) when on the environment

Limited options to sell the recycled material

Recycling machinery is too expensive and only works on high volume



# Introducing a tropical solution for the tropics

- A 6,000 kg per day plastic to fuel facility, built for less than \$500,000
- It will generate fuel to power engines, gasoline, diesel or fuel oil at a convenient price (for reference, we can get diesel at \$0.50 per liter compared with local price of \$0.89 in Fiji)
- The smaller systems would serve a population of up to 100,000 persons. Larger systems can serve the 1 million population of main cities.

# Advantages of the plastic to fuel process

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- It can manage mixed plastics
- It can use contaminated material (dirt, sea salt, food waste)
- It can use degraded plastics
- It has low emissions
- You can sell as much as you recycle (if you convert 100% of plastic back to fuels it would only amount for 5% of the energy needs)
- Fuel does not travel, as it can always be used locally.





# Is this fuel good for engines?

- RECOPE (Costa Rica's state fuel distribution company) tested our products and they are satisfied with the quality. They mix it with their fuel with no changes in their performance.
- We have tested the fuel by itself, with some additives, and it works as well as fuel from oil.
- The fuel has 14% less greenhouse emissions than regular fossil fuels.



# How would it work for Drake Bay?

- Costa Rica would be covered by 8 zones of 50 km radius, serving more than 90% of the population.
- Why 50 km? Cost is king. Transportation cost should not exceed \$0.10 per kg of waste plastic
- How do we pick the center? It should be a circle with at least 100,000 persons.

Fisher Seamount

San Jose

Costa Rica

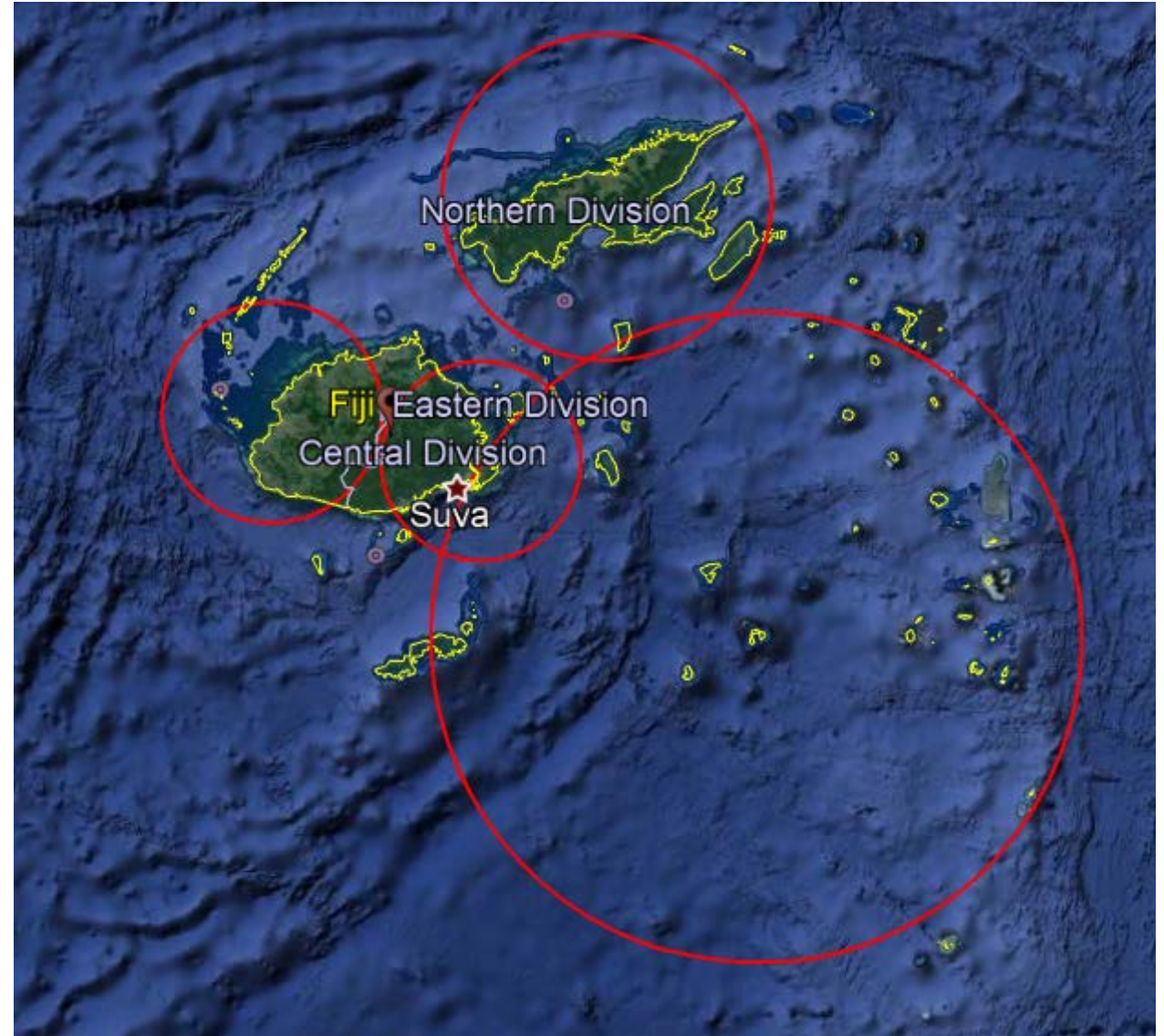
Drake Bay





## How would it work for Fiji?

- Set up 4 locations for plastics to fuel conversion
- Smaller circles mean land transportation (50km)
- Large circle is a 200 km radius. Assuming plastic collection is done once per month, ships would transport between 7 to 10 tons of waste material across the archipelago.





# Applicability

- Some plastics have low yield when converted to fuels:
  - PET / PVC are not recommended for the system
- The system should work 24 x 7 to be economically feasible
- Below 6 tons per day the system can only be financially feasible if it produces crude oil, not refined material.





More information

- We are a Costa Rica company, committed with the environment
- Our goal is to make sure the recycling process is clean, efficient and financially feasible.
- We want to work together to make a better world for everyone



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