IPRO 313
Refuelable Electric Cars

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THE CHRISTIAN SCIENCE MONITOR Bennett

Problem

- Oil Dependency
- Current Electric Vehicles
  - Cost vs. Efficiency
  - Recharge time
  - Service stations

Solution

- Alternative energy!
- Buses & cars
  - Zinc
  - Lithium
- Home & Office
  - Zinc generators

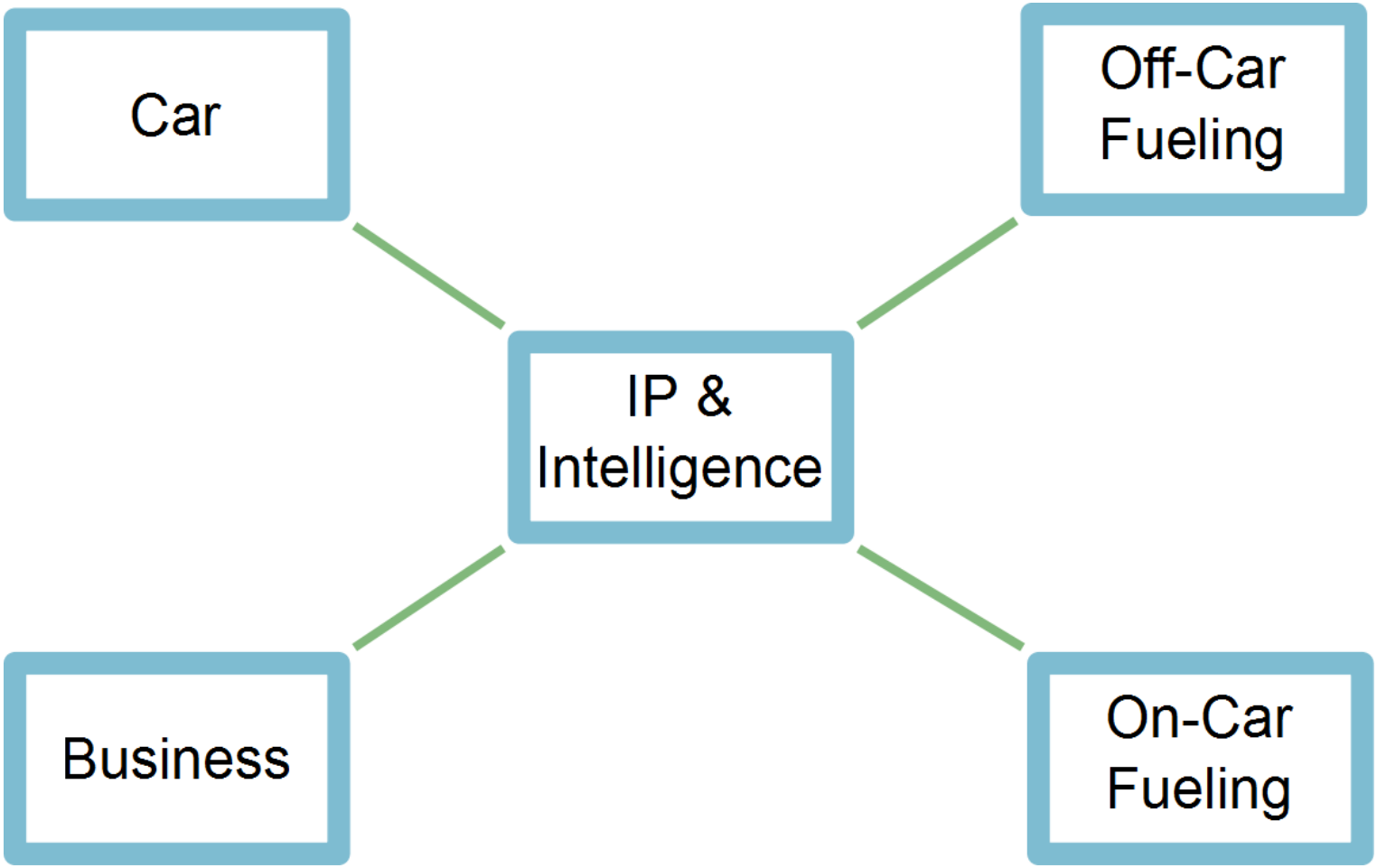
How It Works

- Electric Car
  - AC motor
- Zinc-air Battery
  - Zinc pellets fed to fuel cell
  - Fuel is converted to electricity
  - Zinc oxide and electrolyte byproduct

Background

- Three previous semesters
- Similar team structure
- Accomplishments
  - Truck
  - Zinc
  - Majority turnover

The Teams

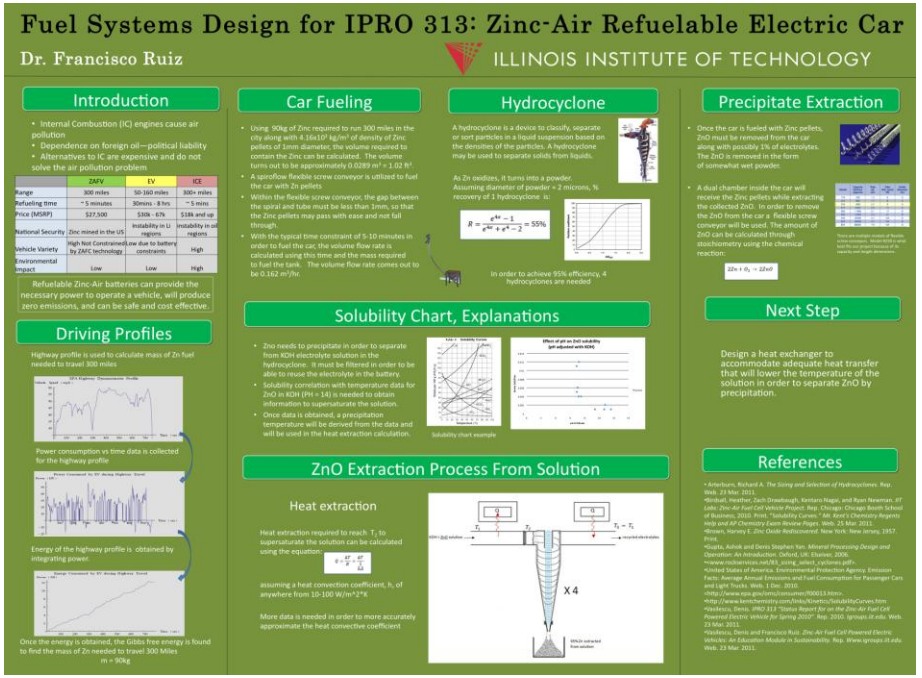

Car
Off-Car Fueling
IP & Intelligence
Business
On-Car Fueling

Business & Publicity

- Public relations
  - Alumni newsletter
  - Website
  - Facebook
  - NBC

Business & Publicity

- Finances
  - IPRO funding
  - MMAE research competition



IPRO 313 Zinc-Air Refuelab
Car Project

Home

Project

Contact Us

Sponsors

Team Members

Thank You to our Sponsors!

Zinc Air Inc.

Ethics

- Ethics versus law
- Proprietary information
  - Zinc Air, Inc.
  - Patents
- Misrepresentation
  - Students
  - “Green” technology

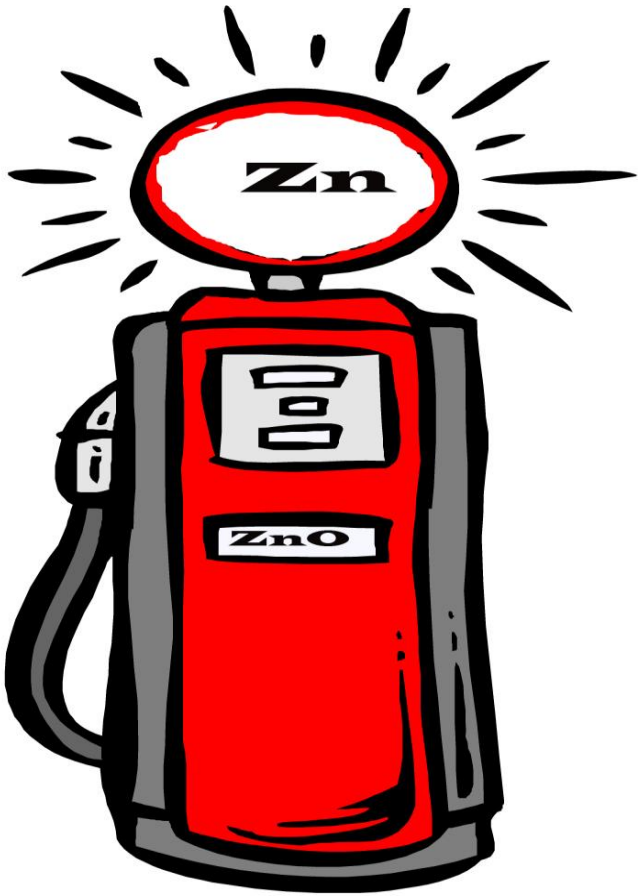
Car

- Design motor bracket
  - Modifications
- Prep for batteries

Car

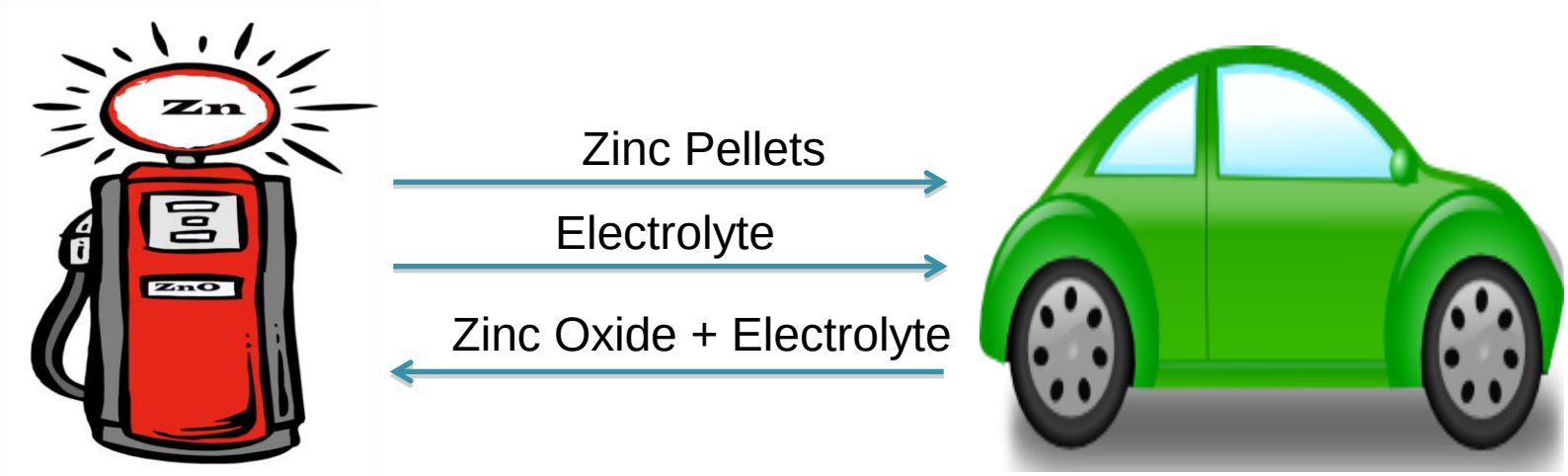
Fueling Systems

- Goal: 90 kg of zinc = 300 miles driving
- On-car fueling
- Off-car fueling
- Zinc Air, Inc.



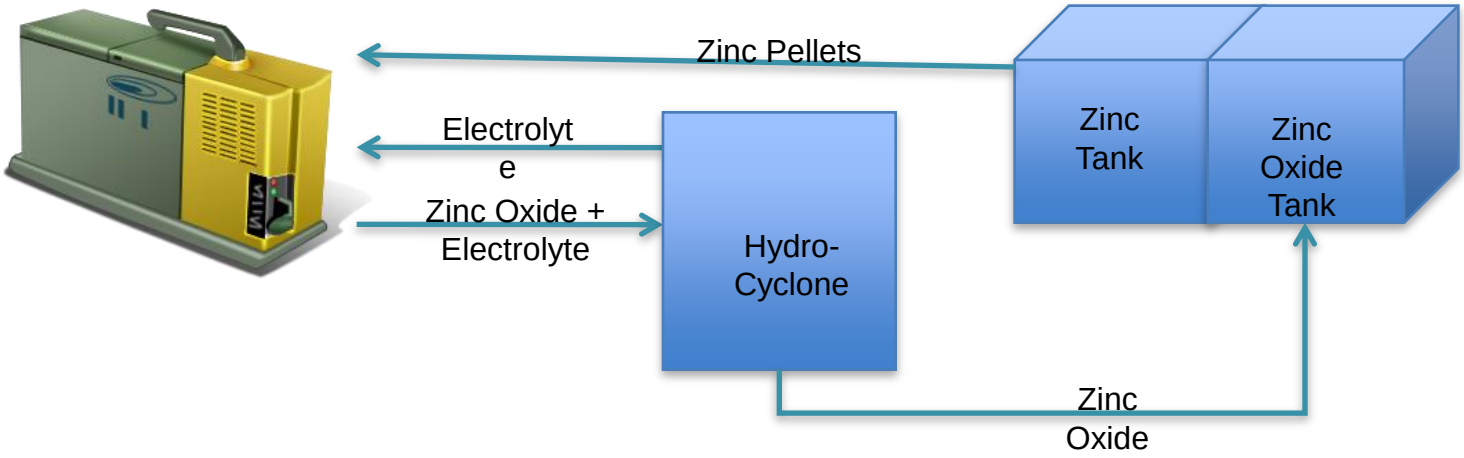
Off-Car System

- System components:
  - Zinc tank
  - Zinc feeder
  - Electrolyte pump
  - Zinc oxide tank
  - Zinc oxide extractor



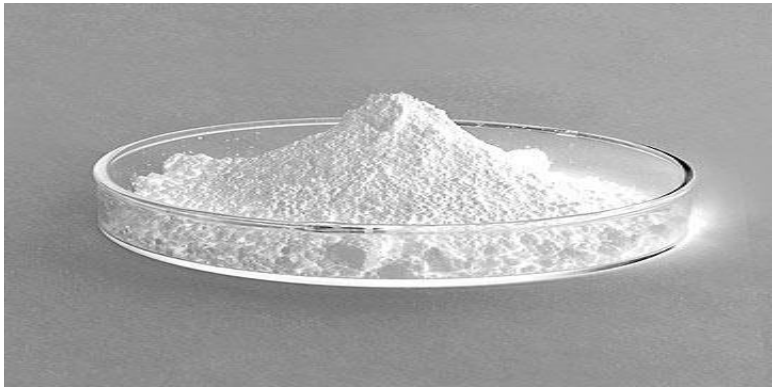
In-Car System

- System components:
  - Zinc conveyor
  - Zinc to zinc oxide tank
  - Zinc-air fuel cell
  - Electrolyte tank
  - Electrolyte pump
  - Hydrocyclone filters



In-Car System

- Precipitation extraction
  - Zinc oxide is removed
  - Electrolyte is removed
  - Zinc oxide is converted back to zinc

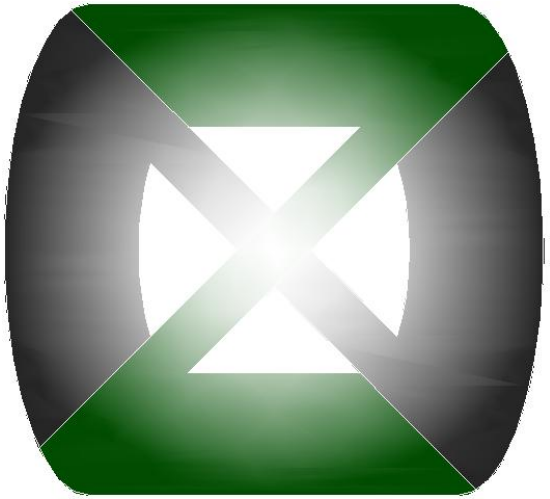


Intellectual Property

- Patent research
- Competitive intelligence
- Act as team liaison
- IPRO deliverables

Results

- Completed motor bracket
- Battery specifications
- Preliminary fueling systems designs
- LinkedIn group, Facebook
- Website in progress



Future Work

- Continue collaboration with Zinc Air, Inc.
- Continue to seek funding & sponsors
- Commercial implementation plans
- Finalize & test fueling designs
- Patent final fuel system designs

Acknowledgments

- The IPRO Office
- Dr. Francisco Ruiz
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- FVEAA

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Any questions?