

SC2 Proposal Executive Summary

Problem

The issues and concerns for the Greensboro area are well documented:

Needs for training identified in the Consolidated Plan of 2010-2014

Increased income needed for the Strategic Plan for East Greensboro

Jobs from the Greensboro Downtown Development

Better Education from the Greensboro Partnership

Opportunities

E DRIVE will add to the identified competitive advantages of the area: Aviation, Innovative Manufacturing, Life Sciences, Specialized Business Services, Supply Chain/Logistics.

E Drive Gateway clusters:

- Aviation- Electric Aircraft- Honda Hybrids, Drones
- Transportation & Logistics- FedEx, Airport, NS Trailer and Container facility (UPS), Duty free zones, Highway systems (Greensboro-the gateway city- 50% of US population is within 650 miles)
- Manufacturing- Repair, Innovation, Reuse, Remanufacturing, Recycle
- Life Sciences- Cleaner Air, Water, Earth
- Specialized Business Service- Motors, Controllers, Converters, Inverters, Energy Storage, for Vehicles and Renewable Energy, modular prototyping, finance and leasing
- Workforce Development- Training and Internships, Curriculum development

Solutions

Preferred State: Highly efficient electric drive using locally produced American Energy. A clean environment, sustainable jobs, training and educational opportunities for everyone. A chance to compete and share. A reputation for innovation.

Goal- To be a world Beater in all things E Drive.

We have a vision!

We have taken the initial steps; have the experience and leadership;

We now have the opportunity! "E Drive"

What is E Drive?

E DRIVE consists of Motor, Controller, Energy Storage, Charging infrastructure and all ancillary equipment. E Drive vehicles can be found on the Moon and Mars. From toys to bicycles to the largest ships and heavy equipment.

The motor has one moving part-the rest is solid state electronics vs the thousands of moving parts in a typical Internal Combustion Engine.

It is electric-often powered by Clean Renewable Energy which shares many components in the Balance of Systems. Nearly half of all EVs use Renewable Energy.

It is Electric- powered by American Electrons produced locally. The grid gets cleaner as time passes- so do Electric Drives.

Vehicles range from small Remote Controlled vehicles to locomotives, from undersea to space. The field is burgeoning, growing exponentially and needing education, support,

maintenance, and development. We have the experienced, talented, creative people to make a sustainable future.

E Drive could decrease by up to tenfold each of four key parameters of manufacturing. These are:

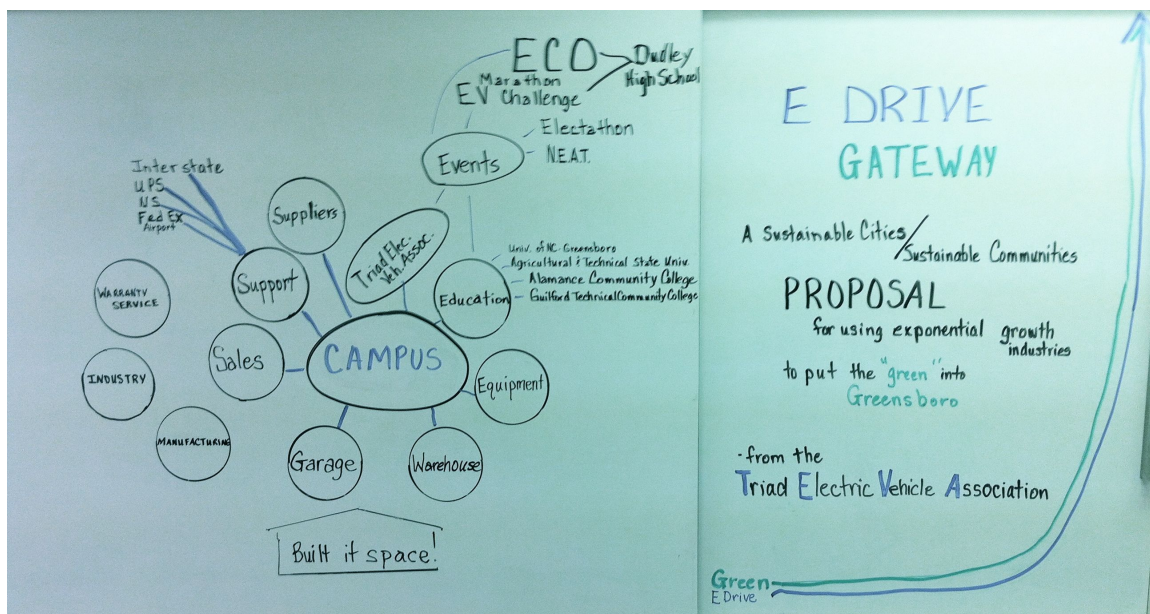
- the time it takes to turn a conceptual design into a new vehicle,
- the investment required for production (which is the main barrier to new firms' or models' entering the market and the main source of automakers' financial risk),
- the space and time needed for assembly,
- the number of parts in the vehicle. Together, such decisive advantages would give early adopters a significant economic edge in what is now a trillion-dollar industry.

Amory Lovins, www.natcap.org

An Exponential Industry growing 40-90% annually, with doubling times of 18 to 8 months. This is the type of opportunity we desire. E Drive is this opportunity.

- New technologies first reach a critical price on par with the technology they challenge. (the majority of new E Drives (EVs) are below the average new car price of \$32,000)
- The second step is to reach a critical mass. (250,000 new vehicles purchased in the past 4 years, expected to double by 2016)
- The Third step is the displacement of the old technology (replacing fossil fueled internal combustion engines with E Drive).
- The fourth step is price reductions toward commodities. (Tesla offers free lifetime use of Electric Superchargers-Austin, Texas offers free nighttime recharging, and half of all Electric Vehicles are charged using Renewable Energy.

(www.ted.com/talks/chris_anderson_of_wired_on_tech_s_long_tail)



Our proposal consist of two parts:

- We would routinely issue challenges to meet Greensboro Transit needs; buses, recycling vehicles, small commuter vehicles, BRT, Solar Goose and better E Drive components. Winnings from the challenges would be used to bring the prototype to production or offering a service.
- The E Drive Campus is designed to bring these activities together for synergistic effect to design and develop prototypes. Trainings and support would be offered. Coop educational opportunities, internships and industrial associations will meet here. As businesses mature they would move out into the community, freeing space for more innovation opportunities.



Example of a service

An EV Drive component has problems. The component is shipped in a dedicated package by FEDx to Greensboro, NC where it is received by a warranty contract facility. The component is connected to computerized testing equipment which runs it through protocols, identifies the problem which is fixed and shipped quickly back to the customer.

A former warranty support company finds that it can build a better component and prototypes their unit at the innovation site. After testing and participating in several Challenges/Competitions, they have people trained and move out into the community as a manufacturer. They become a member of the E Drive community.

We currently have worked with

- 7 Manufacturers
- 7 non profits
- over a dozen events
- 9 educational institutions
- 14 Training courses
- 12 equipment manufacturers

Time line

Description of future-

Imagine for a moment a world where cities have become peaceful and serene because cars and buses are whisper quiet, vehicles do not pollute, and parks and greenways have replaced unneeded urban freeways. A city that seeks solutions for it's own problems, generating "homegrown" opportunities with global markets. Where a young girl of color inspires a school with a world competition winning Electric Vehicle she helped design and build. In fact, the changes described here could come about in the decades to come as the result of economic and technological trends already in place.

Accomplishments-

Cannes Film Festival Award

Dudley High School's Advance Vehicle Technology group is making news on the international scene yet again. DHS has done 10 vehicles in 4 years for the Shell Eco Marathon. It has helped Duke University the past 2 years (Duke U came in 2nd and DHS 9th in the electric prototype and 5th in the urban concept categories). Articles in Wired Magazine and National Geographic have highlighted DHS using recycled materials. Shell produced the "Road to Houston" video series about Brazilian, Canadian and US teams. Dudley was the US team. The documentaries were released onto the web. They were subsequently entered into the Cannes Film Festival where they won the Silver Dolphin Award out of 712 entries from 40 countries.

The Light Electric Vehicle Association developed and provides Technician Training at InterBike <http://www.levassociation.com/leva-certified-technician-training/>

Opportunity next 4 years-

- Capitalizing on the universities and colleges in the greater Greensboro community and high-impact collaborations between these institutions and the private sector; Our E Drive campus center will be a focus to combine the synergies of business, industry, manufacturing, training/workforce development, and educational support.
- Attracting people, businesses, and investment in the downtown area; Our campus will be a industrial incubator where space can be rented out to develop prototypes. Once mature, the company will move out into the near by buildings to manufacture and service their products. We hope to use Indiegogo, Kickstarter, Sustainable Jobs Fund (<http://www.sjfventures.com>) and Self Help Credit Union (<https://www.self-help.org/>) to align investment.
- Enhancing the arts and other quality of life features: Clean tech offers to improve the environment. Cleaner air, water and land. E Drive provides the power for parade floats and income from workers enhance the arts.
- Improving the impact of Piedmont Triad International Airport and airport area infrastructure to support the new E Drive industry.
- Workforce development: We offer advance training in E Drive both recognized nationally (National Alternative Fuels Training Consortium) and internationally (Light Electric Vehicle Association).

- Advanced manufacturing. E Drive Gateway is a vision to develop innovation, service and an exponentially growing industry to the Greensboro area. TEVA has members who have designed, built and trained people for the E Drive future.

Budget

Overall opportunity \$ 1 Trillion (1% is \$10 billion dollars)

Present opportunity- >\$3,000,000 (cost to get an industry started)

E DRIVE Campus ½ for the center

Greensboro Challenges ½ for the challenges

Key Resources

Triad Electric Vehicle Association (TEVA) has over a decade of accomplishment meeting over 98% of the organization's Goals and Objectives. <http://localaction.biz/TEVA/G&O.pdf>
 Greensboro Odyssey Expo <http://localaction.biz/TEVA/2013%20Odyssey%20Poster.pdf>
 Downtown Greensboro <http://downtowngreensboro.net/blog/press-releases/alternative-fuel-vehicles-on-display-in-greensboro/>

City of Greensboro <https://greensboro.sc2prize.com>

Universities and Schools <http://dudleymotorsports.weebly.com>

EV and STEM Cycle Challenges <http://www.evchallengekids.org> ,
<http://www.evchallengekids.org/electrathon-based-pilot-project/>

Results

- A program with international recognition
- Story of the sower Matthew 13: 1-23, We need to prepare fertile soil
- A place to happen, the E Drive campus.

Challenges to be met, a Future with a new, dynamic economic development strategy. The City of Greensboro can create a climate for growing higher wage jobs and fostering innovation as well as preparing the path for long-term sustainable growth that will inject vitality throughout the entire area.

E Drive is coming. Greensboro could be the "Gateway". TEVA will continue to pursue the E Drive vision. We have already accomplished much. The new industry is growing exponentially. The related Solar and Renewable Energy economies are growing exponentially. The related green economy is growing exponentially. The E Drive Campus is a critical component, as are the Challenges. We have the people, experience, opportunity and the vision for a new industry-

E DRIVETM

Video at: <https://www.youtube.com/watch?v=dypTNc0ooY8>