Let's Win the Race to Net Zero Carbon

Footprint to Wings

Steps to Win the Race:

A. Check Emissions
B. Decarbonize Energy Supply
C. Streamline Demand
D. Elevate Quality of Life for All

Rules & Tools

The First STATE to achieve a net zero carbon economy with the best quality of life

Wins!

Carbon measured in Metric Tons equivalent per Capita.
Quality of Life must improve above present levels.
Mega state scale prizes to be determined and donated.
No taxpayer dollars will be harmed.

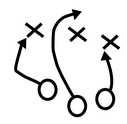
Playbook

Teams

Your TEAM is your STATE, as a whole. Individuals (Voter-Consumers) are **PLAYERS** - the core indivisible unit of the team. Individuals coordinate to form **SPECIALIZED TEAMS** within the State team. Examples: Team Solar, Team Divestment, Team LEED. Teams can be households, corporations, clubs, schools, counties. **All the teams must pull together for the State to win.**

Fields + Plays

The **SPECIALIZED TEAMS** are deployed to different **FIELDS** where they face many challenges and opponents. Most players are part of multiple teams and play on multiple fields, from backyards to boardrooms and government offices. Sometimes the field and the team are the same, and the play is an internal struggle with a conflict of interest.



Many different **PLAYS** are possible in the race. As you gain clarity on the teams and the fields, different plays suggest themselves. Which plays will be most effective? Which will stand out in the winning playbook?

Join our merry band
of Carbon Free Coaches

fp2w.org
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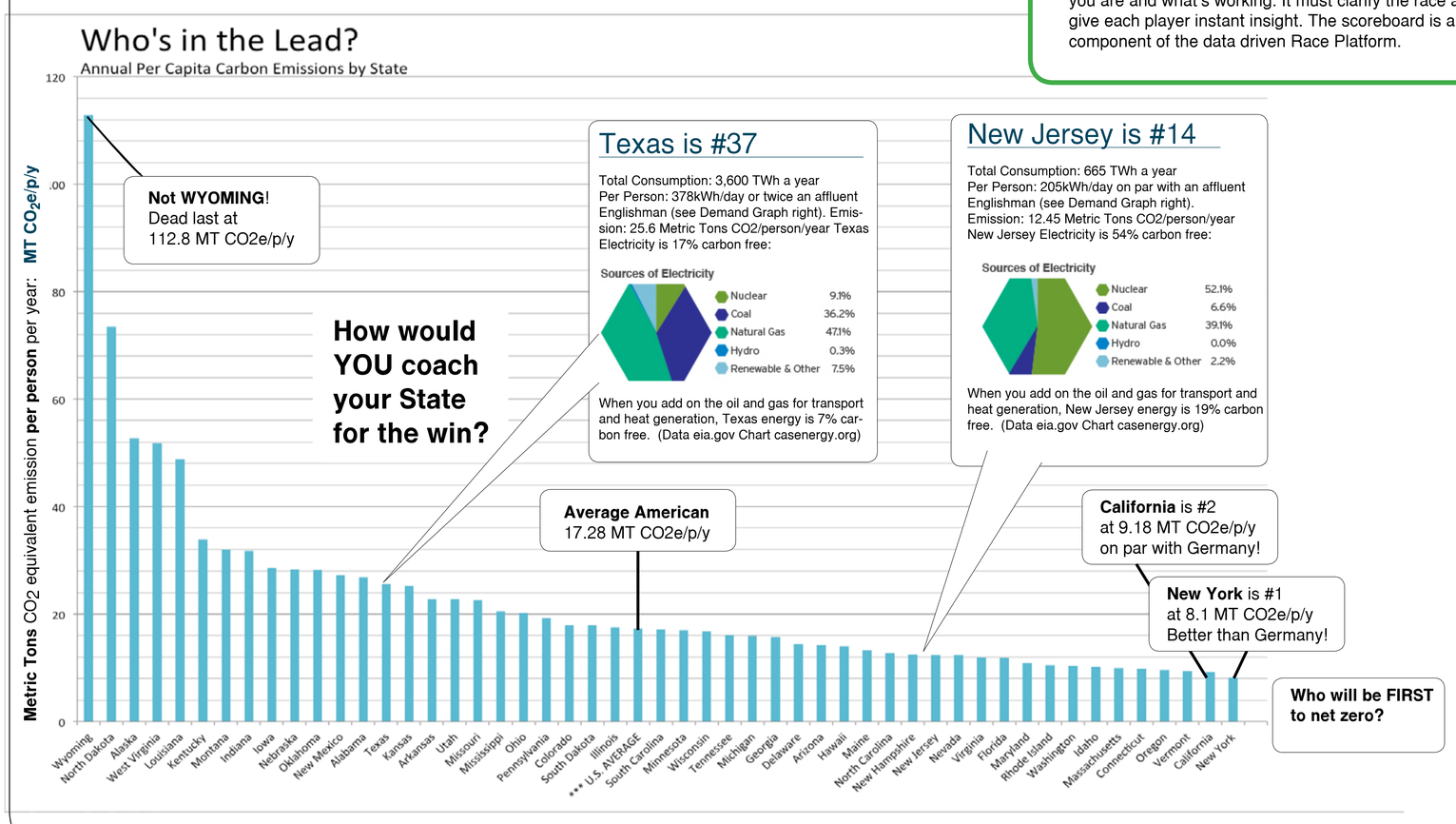
A. Check Your State's Emissions

Establish the Baseline. Know your state, to better coach your state. Each State is unique.
Standardize Units. Get all the teams on the same "units" page for comparison and strategy.



Keeping Score

A Compelling Scoreboard

...will connect local scale initiatives to the big hairy goal. It must track the cumulative impact of the bold work being done by the specialized teams on the various fields. It must be instantly understood. It must show you where you are and what's working. It must clarify the race and give each player instant insight. The scoreboard is a key component of the data driven Race Platform.

C. Streamline Demand

In his book, "Without Hot Air" (free at http://withouthotair.com), David MacKay breaks down energy demand into nine categories as shown below.

Note, this graph shows an estimate of energy use for the typical, moderately affluent UK citizen - 195kWh/day. The AVERAGE UK citizen uses less, about 125 kWh/day. How does your state compare? Each State will have a unique demand profile.

Demand Fields

Each of these areas of demand can be considered a Field of Play, requiring a specialized Team and specific Plays. This chart helps you see how much impact each play might have. But beware, there are many hidden challenges.

Take "Stuff"

The plays seem obvious. Reduce, re-use, recycle. Consume less. Demand that companies make things that last.

We don't even want most of that stuff. See the "Story of Stuff". About 80-90 percent of this stuff is unwanted clutter.

If we just eliminated it, we wouldn't need to use all the energy for making the stuff or hauling it around or disposing of it. And we wouldn't need to drive to work and back every day to jobs making useless stuff.

And there's the rub. It's not the stuff, really, **it's the JOBS that are the problem.**

Or rather, the way we've bundled our self worth with jobs.

We haven't figured out a way to calculate the worth of our fellow human beings unless they are making some stuff.

Figure that one out, and you've won half the race.

D. Elevate Quality of Life for All

This race can only be won if everyone's quality of life improves in the running of it.

We have Ten Billion People to serve.
We all deserve a great quality of life. How is this going to work? In the US, we have a high standard of living. Can we have it sustainably? If yes, then our way of life can work for the rest of the world. If not, Yikes.

If your solutions don't scale to everyone, then they won't be viable. This race does not look kindly on lifeboat solutions. Don't let the ship sink, and only work to stock your lifeboat.

Think about how to achieve **global sustainable washing machine.**

But Standard of Living and Quality of Life and Happiness are all slightly different.

In this race, kick back with your teammates and discuss. What is your vision of what you really want in life?

Here are a few of our favorite visions:

- Jaron Lanier: "Who Owns the Future"
- Rob Reid: "Year Zero"
- Raptitude: "Your Lifestyle Has Already Been Designed."

It's not just about the stuff. The material part is easy to measure and technically to achieve. But what about that other stuff? The way we value each other (or don't). Worthiness. Jobsolescence. Time. Joy. Deep thoughts.

Join us for libations and conversations!

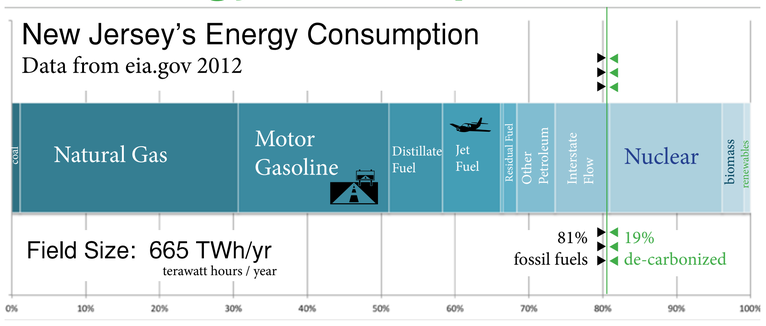
What is YOUR vision?

B. Decarbonize Your Energy Supply

- Switch out fossil fuels with zero carbon energy.
- Don't stop at electric power, keep on through transportation, jet fuel, gas and oil for heating.
- What you can't electrify, offset through carbon sequestration.

Fields of Play include:

The Energy Consumption Field



In football, the FIELD is 120 yards long. TEAMS compete to move a ball into the opponent's end zone. In the race to net zero carbon, the field is not measured in yards but in units of energy. We prefer TWh/yr ("terawatt hours per year"). The goal is to go ALL THE WAY into the fossil fuel end zone and beyond (additional sequestration). Field size varies by State energy consumption.

Demand-side Plays include "shortening" the field via conservation and efficiency (using less energy).
Technology Plays include innovations in efficiency, storage and new ways to generate power.
Supply-side Plays include **de-carbonization.** You use energy, but it is from a zero carbon source.
Different energy sources face different challenges as they gain TWh/yr:

- **Teams Wind** and **Solar** must overcome NIMBY (see below) and finance issues to get all the necessary turbines, panels and power plants online. With intermittency, they also need innovations in storage and to play a tighter Grid-dle game (see right).
- **Team Nuclear** must also overcome NIMBY and finance issues. It has the technical capacity to gain substantial TWh/yr, but will need to win over a lot more fans if it intends to go the distance.
- **Team Fossil** has an important play. It can actively retreat from the energy field. There is a major market for non-FUEL fossil products. Can the shareholders refrain from burning every last bit? Shift to a slow non burn.

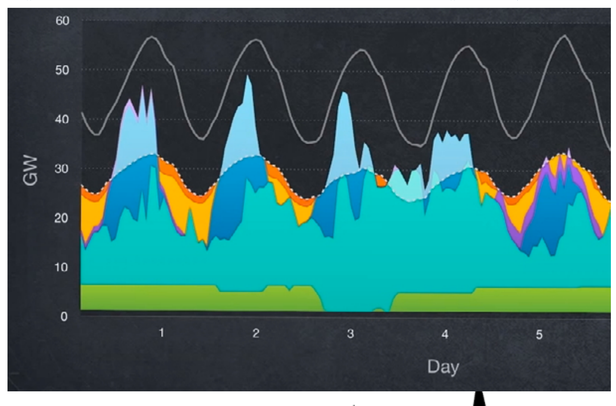
The Grid-dle

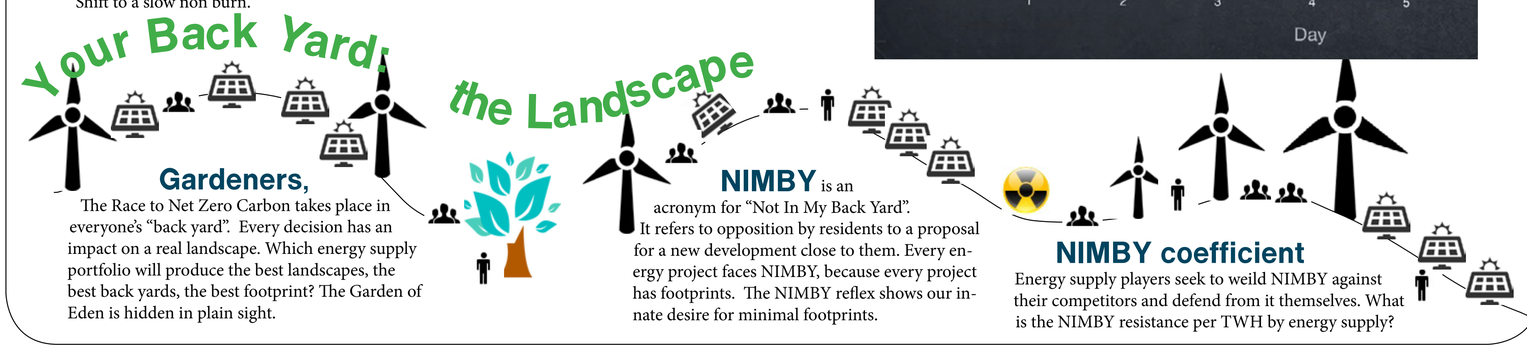
The Power Grid is an amazing engineering achievement. Every day it balances energy supply with consumer demand to provide uninterrupted operation of our lives. Changes to the energy supply require substantial transformation of the grid.

In this excerpt from a chart by the Rocky Mountain Institute (below), we see some of the choreography required to balance a 100% renewable load. The grey line is the present load. The dotted line is "load after efficiency" which means that this model assumes reduction in energy demand due to efficiency of 25-45%. Is that a stretch? This chart is for Texas, which consumes twice as much energy per person as New Jersey.

Teal is wind power and blue is solar. The light blue spikes are excess energy (now that demand has been reduced) which is diverted to storage. The light orange is storage recovery. This means the system needs store and recover around 10 GW of energy every day. Dark orange is "Demand Response" which requires active consumer participation. For a video that explains it all, visit:

http://cleantechnica.com/2014/08/08/rmi-blows-lid-baseload-power-myth-video/





Gardeners,
The Race to Net Zero Carbon takes place in everyone's "back yard". Every decision has an impact on a real landscape. Which energy supply portfolio will produce the best landscapes, the best back yards, the best footprint? The Garden of Eden is hidden in plain sight.

NIMBY is an acronym for "Not In My Back Yard". It refers to opposition by residents to a proposal for a new development close to them. Every energy project faces NIMBY, because every project has footprints. The NIMBY reflex shows our innate desire for minimal footprints.

NIMBY coefficient
Energy supply players seek to weild NIMBY against their competitors and defend from it themselves. What is the NIMBY resistance per TWH by energy supply?

Find More Teams + Plays + Fields:

Technology Players:
Innovations and improvements in technology have an impact on the viability of various energy solutions.

Financial Players:
Behind every power plant is a considerable financial investment and multiple institutions. Banks, Investors, Pension Plans. Investment, Divestment, "Push Your Parents", "Ceres Clean Trillion".

Regulatory Players:
Policy makers, regulators, legislation and enforcement. Government initiatives. Note that government derives its powers from the people. You can move the government lever with votes, petitions, letters and...cash.

Carbon Pricing Players:
At the intersection of finance and policy. Ideas include "Cap and Trade" and Fee and Dividend. These must be agreed to by policy makers, multiple stakeholders, institutions.

Corporate Players:
Companies are formed to deliver a return on investment, via delivering some product and service. This priority creates an incentive to externalize costs to maximize profit. Some feel the profit motive is inviolable. Others disagree. See the rise of The B Team, Benefit Corporations, Corporate Social Responsibility and impact investment.

The Field Within:
You are playing against many forces, such as corporations and investors, but it turns out that these are often you as well. As an employee or employer in a corporation, you have a vested interest in the success of the corporation. As a pension holder or investor, you have an interest. As a taxpayer, you have an interest in keeping taxes low.

Wicked Problem

Global Climate Change is defined as a "Super Wicked Problem." In fact. Google it. A "Wicked Problem" is defined as a problem that is difficult or impossible to solve because of complex interdependencies. Solving one aspect of the problem reveals or creates other problems. A "super wicked problem" has the following additional considerations:

1. Time is running out.
2. Those seeking to solve the problem are also causing it.

A "wicked problem" relates to the problem itself. A "super wicked problem" relates to the agents trying to solve it.

Take the Survey:

Is a High Quality, net zero CO2 economy possible?

Check one:

Δ **I don't know**. Could it be? Do I dare dream? I need more information.
Δ **No. We're doomed.** I'm working on my lifeboat.
Δ **No. And why should it be?** We're fine. I roll coal in your direction.
Δ **YES! Of course it is.** Let's get going. Last one to "post carbon" is a rotten egg.

Sign up for updates to fill in our survey online: http://eepurl.com/1ICBf

Abstract - About Us

Footprint to Wings ("FP2W") is a New Jersey nonprofit launching a movement around the "Race to be the first net zero carbon state". The first US State to achieve a net zero carbon economy - with the best quality of life - wins. Our objective is to host a platform, compelling scoreboard, protocols and materials to track the race, referee the race, and coach contenders for the win. We invite states to formally join the race. We foster carbon free coaches and announcers. We recruit sponsors to provide prizes. We coach and are coachable. We are committed to everyone winning the race, but someone's going to win first. This poster presents an overview of our strategic framework for winning the race to zero carbon. Our project will connect data to human motivation in a real, urgent and effective way. We are here to seek guidance, feedback and collaboration from our fellow climate enthusiasts.

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