

What's Stopping Us?

Recognizing and Removing Obstacles
to the Launch of Ammonia Fuel

9th Annual NH₃ Fuel Association Conference
San Antonio, October 2012

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Part 1: NH3 Fuel Strawpoll

- Getting to Know You, the NH3 Fuel Community
- Diverse Industries
- Diverse Goals
- Diverse Visions
- Small sample size:
 - charts not statistically useful
 - but illustrate Consensus / Division of opinion
- May not apply to individuals
- Definitely helps us understand
 - how to build a movement
 - what we need to do now

NH3 Fuel Strawpoll

Visions, Roadblocks, and Government Engagement

Conversations with the NH3 Fuel community: Trevor Brown, Summer 2012

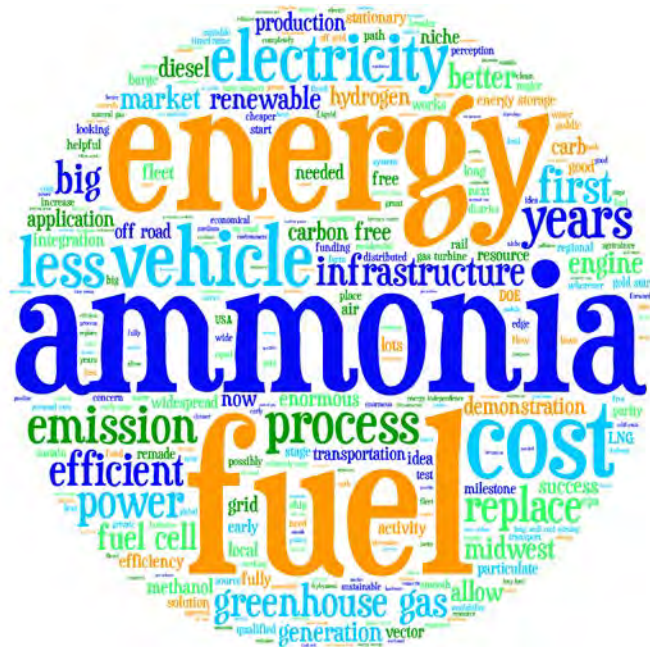


Illustration contains all relevant words recorded in answers to the question "What's your vision for NH3 fuel?" Font size is proportional to frequency of use. "NH3," the single most frequently used word, is omitted because the algorithm won't crunch numbers.

NH3 Fuel Strawpoll

Summary

This is an informal "straw poll." I interviewed 26 individuals involved with the NH3 Fuel Association, or pursuing NH3 as a fuel, to discover what opinions exist. I interviewed them by phone or e-mail during the Summer of 2012. I transcribed the phone conversations.

26 is a very small sample size and this is a very diverse group so, although I categorize opinions and

Participants represent the following industries:

Academia

Advocacy

Alternative Fuel Production

Ammonia Production

Energy Production

Engineering – Consumer

Engineering – Industrial

Engineering – Research and Development

Public Policy Development / Think Tanks

All participants work in the US.

All participants but one are male.

Percentages

May not add up due to rounding.

Calculated by dividing responses within each question by the total number of responses to each question.

Some participants did not answer all questions. Some questions were not given but it was possible to answer from other comments, so those answers are included.

Some questions are not represented.

Some questions receive equal weight. Where multiple answers are given, each of those answers receives proportionally less weight.

Quotations

Comments are included to illustrate the diversity of opinion and insight. Their presentation shouldn't be interpreted as reflecting weight of general opinion: where many comments are similar, only one is included.

Comments do not necessarily represent the opinions of the author or NH3 Fuel Association. Some comments may be edited for brevity but their meaning is not misrepresented.

Abbreviations

NH3 = Ammonia

CO2 = Carbon Dioxide

H2 = Hydrogen

MeOH = Methanol

Ag = Agriculture / Agricultural Industry

EV = electric vehicle

KBR = KBR Inc (formerly Kellogg Brown & Root)

RFP = request for proposals

SOFC = Solid Oxide Fuel Cell

TOC = total cost of ownership

VC = venture capital

ARPA-E = Advanced Research Projects Agency – Energy (DOE)

CARB = California Air Resources Board

CEC = California Energy Commission

DOA = U.S. Department of Agriculture

DOD = U.S. Department of Defense

DOE = U.S. Department of Energy

DOI = U.S. Department of the Interior

DOT = U.S. Department of Transportation

EPA = U.S. Environmental Protection Agency

FEMA = Federal Emergency Management Agency

IMO = International Maritime Organization

NSF = U.S. National Science Foundation

OSHA = U.S. Occupational Safety and Health Administration

POTUS = President of the United States of America

TSA = U.S. National Highway Transportation Safety Administration

What's your vision for NH3 fuel?

"20-30% profile for transport energy in USA"

"Significant integration on **fleet vehicles** and **stationary applications**"

"Farm first, then off-grid generation"

"Replace gas turbines"

"Storage for remote power, also off-road applications"

"Off-road diesel equipment first, including rail. Then possibly ships and barges. Automobile fuel will come later, depending ..."

"Ag market: tractors, irrigation, etc"

"A **zero-carbon** global energy system"

"Local energy covering 80% of what is needed to sustain 7 Billion people"

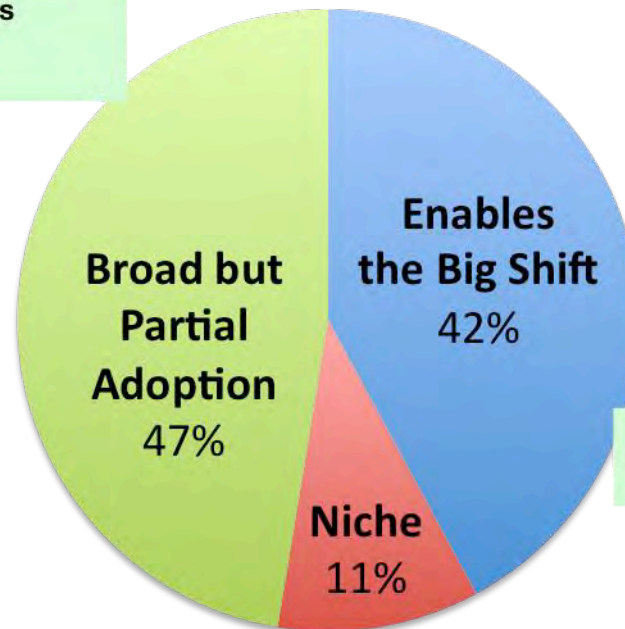
"Ammonia as a hydrogen carrier in a **Hydrogen Economy**"

"Liquid, carbon-free mobile and stationary power"

"Energy independence and less air pollution"

"A **completely remade** and **sustainable** energy economy"

"Cleaner environment, cheaper fuel"



"Farmer-owned ammonia production"

"Replace **10-20%** of diesel/gasoline"

When will it happen?

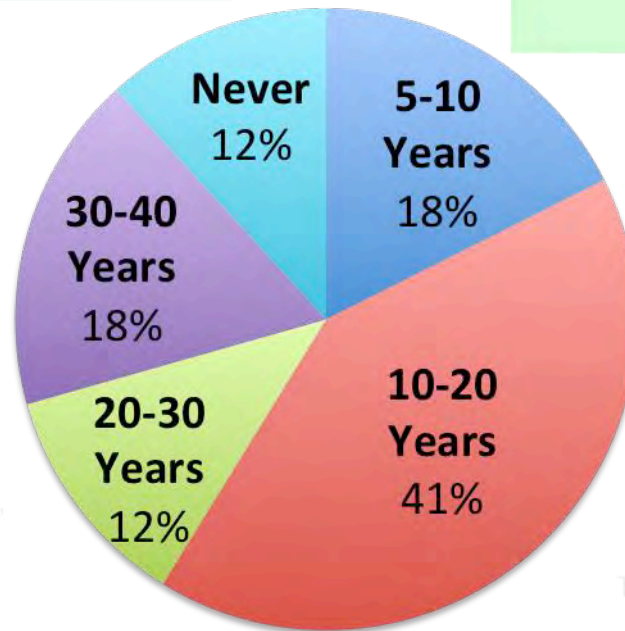
"I don't know of any plans that will make this happen"

"Within five years of approval of ammonia for an alternative vehicle fuel"

"Not in my lifetime"

"Zero carbon: 2050"

"Qualification in 5 years, 5 years after, significant momentum, 20-50 years later, alternative fuels and energy technologies become dominant"



"Major auto companies indicated that oil companies said they need to be ready for big alternative switches in 2022-2025. That's when the real transition will start. There's cooperation in long-term planning. Big Oil has a clear map, and they don't want to see real change until then"

"A successful demonstration ... so they can allow ammonia as an alternative fuel ... followed by a loooong certification process (5 to 7 years) for on-road vehicles"

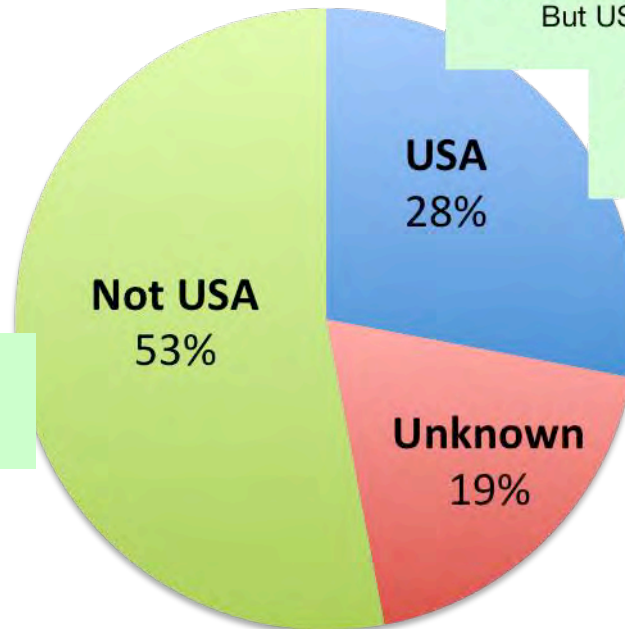
Where will it happen?

"Other countries appear to have a head start"

"Possibly starts in California, but they're too averse to risk – they won't be tenable to it. Can't take a quick idea and react"

"Hard to start here ... but we have to start in a country or region where the US is looking"

"Definitely international, better chance for demonstration"



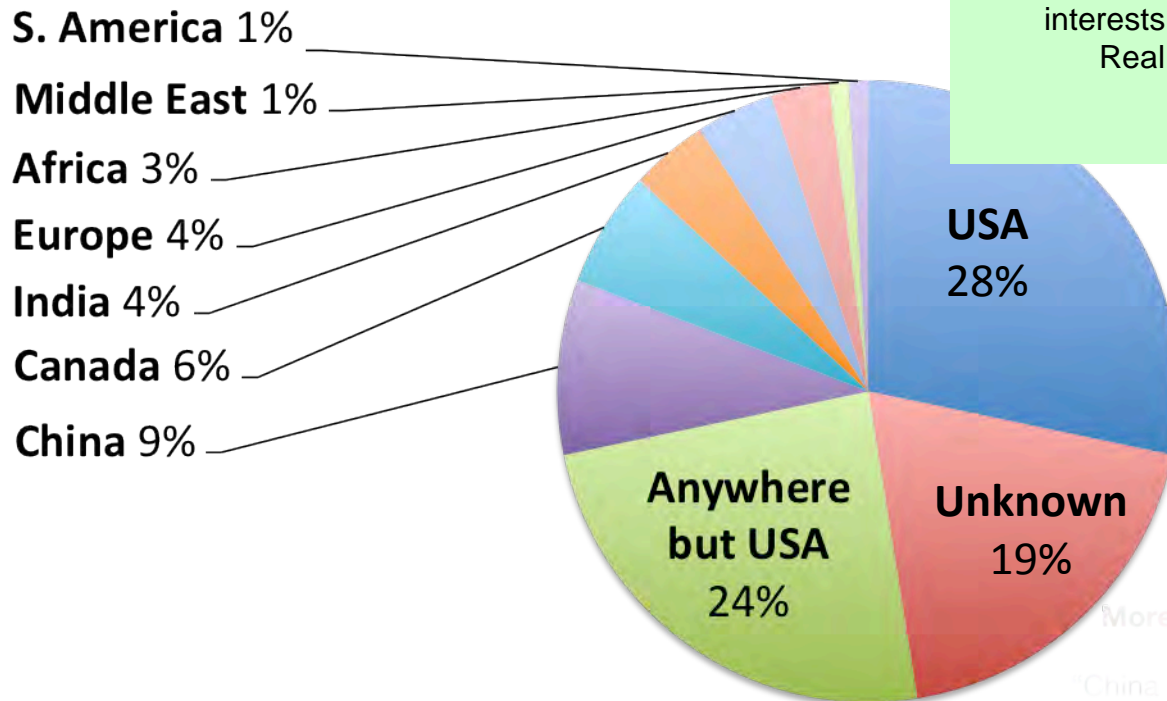
"Our world is highly connected – it's a question of where the advancement happens, and it will spread. But US has the **venture capital** that it will need"

"Doesn't need to happen here, but seems like the **critical mass of NH3 people** are here in North America"

"Starts with off-road certification from EPA / CARB. Much simpler than on-road"

Note: "Unknown" category represents responses where, considering all alternatives, it was impossible to determine any answer. It does not represent "no answer given" (these responses not included in charts) or multiple answers given (included in other categories).

Where will it happen?



“Markets will develop outside US first – entrenched interests against you here, also **market forces**. Real interest is in India, Africa, Middle East. Where there isn’t entrenched system, and **gov’t can dictate what to do**”

“Canada – fuel comparison better (similar to Europe), no retrofit rules (but big safety compliance)”

“Lower safety threshold countries, with pollution issues in large cities: China, India. They’ll hedge diesel”

“Progressive European cities”

“It will probably start in China. More discipline, focus, and energy demand”

“China can simply say ‘This is what we’re doing’”

“There’s a product that works, fuel cell and reformer, with no demand in USA (market died due to MeOH competition), that has entered commercial service in Africa. Note the geographic location and that they **partnered locally** with an industrial fuel provider. The business model displaces diesels and delivers power to off-grid cell tower sites. For the cellular company **TCO is lower** than diesel, which was their only other option. The service is ‘power’ and **the customer doesn’t touch anything**. They **don’t care if it is NH3 or hamsters in an exercise wheel** delivering power”

What will stop it from happening?

3% SAFETY REGULATIONS

“Very complex, expensive. Safety standards are written for big industry (pipelines), not for small, local usage. Either beef up components (safer) or rewrite standards (takes ages)”

7% EMISSIONS

“Considerable testing required, both fuel and how the fuel works in the engine”

7% LACK OF PERSISTANCE

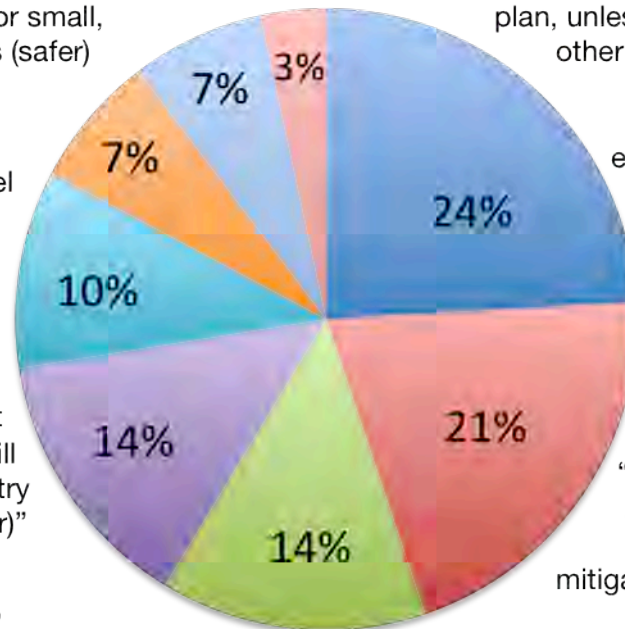
“Need to be much more aggressive”

“This is within our power. Need money and cooperation of public agencies, but there’s no conspiracy against us. We will find organized resistance from oil industry (though we can avoid this if we’re clever)”

10% OPPOSITION

“Big oil, irresponsible financial markets”

“Ag industry has cushy job, huge margins. If NH3 was a fuel, it would be much more competitive and regulated. Grow by factor of 100, but lose margin. Why wreck existing easy life?”



24% AMMONIA STATUS QUO

“It is unlikely that any entity can formulate a viable business plan, unless ammonia can be made from something other than, and more cheaply than, fossil fuels”

“It’s not emissions, it’s not safety. It’s economics and manufacturing techniques”

“Where farmers get fertilizer is where fuel cell vehicles will get hydrogen. Our local ag industry prefers other fertilizers”

21% NO GOVERNMENT SUPPORT

“Inertia, risk-avoidance, no investment”

“If government doesn’t get over the fear of ammonia then resistance to implementing new policy will be filled with very costly mitigations and regulatory compliance hurdles”

14% SAFETY PERCEPTION

“Safety perceptions (not actual safety). Our achilles heel is hyperbole, coming from existing fuel producers”

14% COMPETITIVENESS

“Natural Gas ... too cheap”

“You only hear about NH3 when there is a huge disaster. There is no positive message to industry or public”

How vital is government action?

"Has to come from **philanthropic** world, an 'X Prize for' ... and **VC funding**, maybe \$100m"

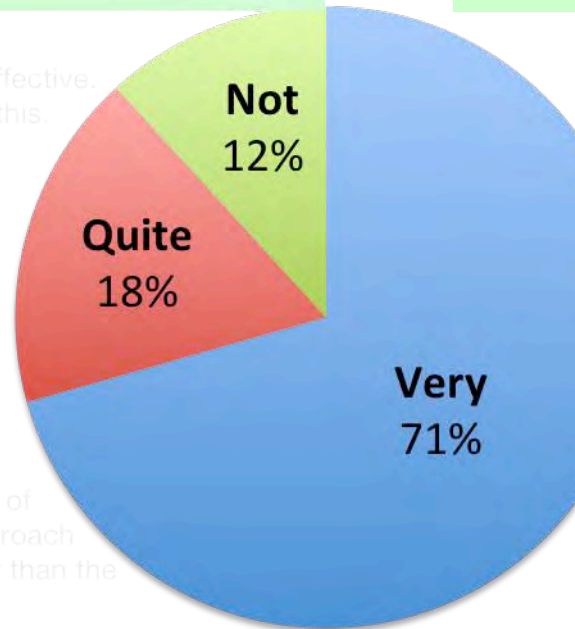
"Critical. You can't deploy ammonia as a fuel because it is **not recognized as a fuel**"

"Government action hasn't been very effective. I'm **not sure** what can be done about this. Maybe governments can never be very good at picking winners and losers"

"Major, but **not likely to happen**"

"Let us hope that we can devise a plan that relies primarily on **market forces**. We are in a period of government impasse and incompetence from which we may not emerge for some decades. I recommend that we create an alliance of commercial organizations and then approach government entities to support it, rather than the other way around"

"We should be focused on **customer solutions**, and any governmental change should be focused on helping the customer **defray the capital cost** barrier to new technology"



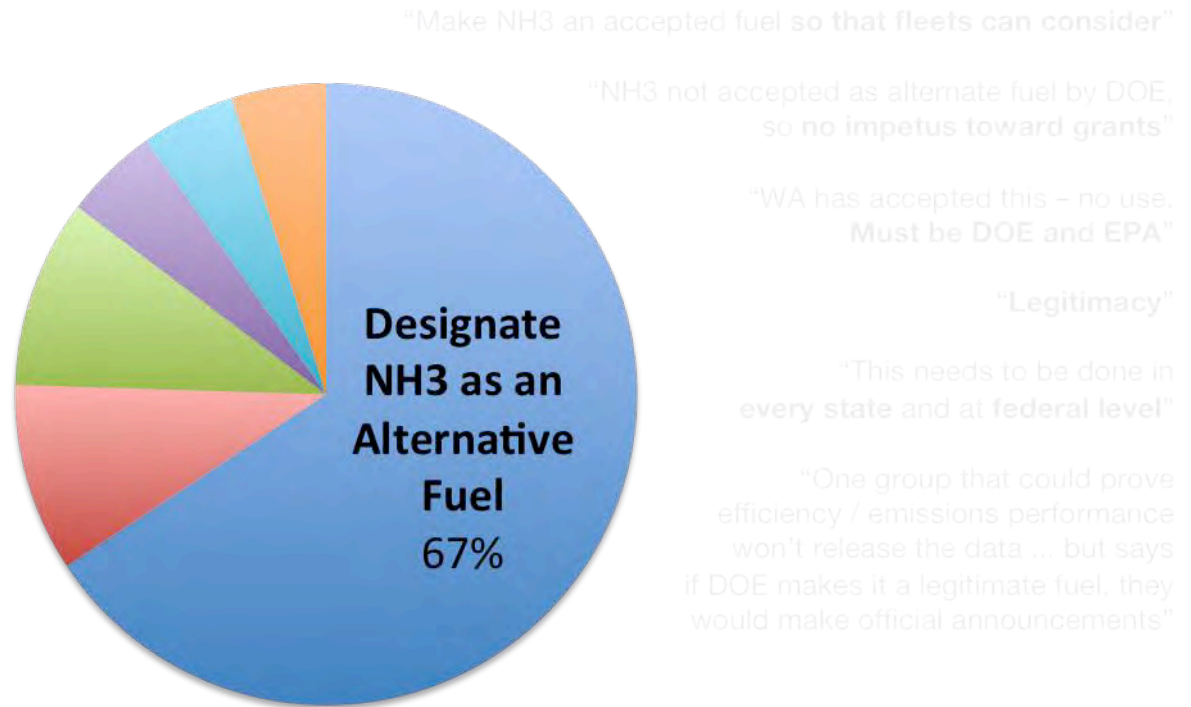
"Government is a **necessary disruptor** to private industry which is inherently limited in interest and imagination"

"NH3 will have to **compete with other alternatives** that are already heavily **subsidized** by the government"

"**Funding**"

"Utmost importance. Government **influences public attitudes and beliefs**"

What one thing could government do?



What one thing could government do?

5% CARBON POLICY

“Strong CO2 reduction regulations may also drive interest”

5% FOLD NH3 INTO HYDROGEN

“They’ve made commitment to a **Hydrogen Infrastructure** – but you still can’t fill your tank. Ammonia can help”

10% SAFETY

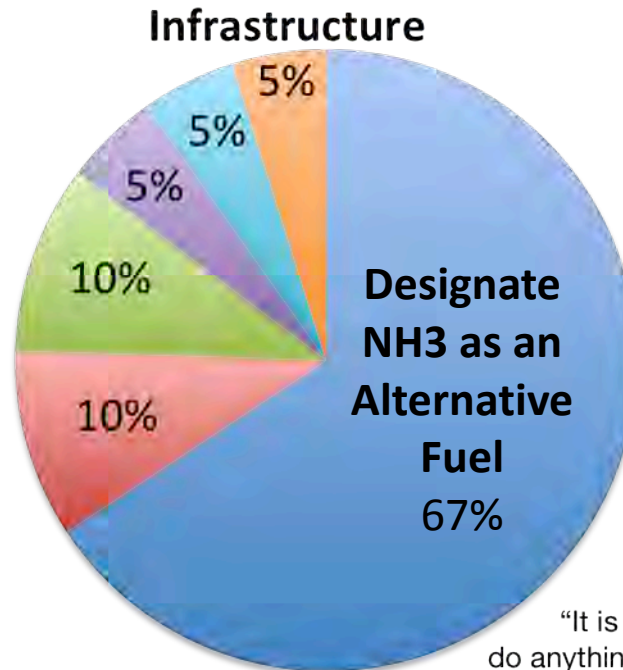
“Find an ammonia tank filling process to **make my wife feel comfortable** filling the tank”

“Change the **permitting** structure”

10% FUND R&D

“Chicken / Egg:
need **proof of concept** to get funding,
need **funding** to get proof of concept”

“Get the **1603 Treasury Grant** program re-instated”



“It is a waste of time and money to get them to do anything relating to NH3. The problem is twofold:

1. **Affordable devices** to turn the liquid into electricity.

Combustion engines or fuel cells. **There has to be demand** for the product.

In this economy TCO or lifecycle cost benefits are not even worth bringing up.

2. Commercial and **industrial acceptance** of the fuel itself and distribution / handling.

There is no demand due to a **basic fear of the chemical**, and not having a **second tier distribution / delivery network**, so the customer doesn't have to handle it”

What would gov't action achieve?

3% FUND REGULATORY TESTING

"Funding for emissions tests and field tests, to allow regulatory approval"

6% LEND CREDIBILITY

"Viability, infrastructure, safety issues can be overcome if government legitimates things. Doesn't take billions, but does need time and a lack of interference"

9% SPUR CORPORATE ACTION

"Both suppliers and car companies are too exhausted to want to pursue NH3. Too many alternatives. Just too tired. No room in the portfolio"

"Auto manufacturers don't want to create 'regional' fuels, so they're unwilling to be lead runners on creating a new option"

11% UNLOCK PRIVATE FUNDING

"We can't expect private investors to do much in advance of actual markets"

"Producers and distributors, including those who build the plants (like KBR), can start funding research"

37% UNLOCK GOVERNMENT FUNDING

"Some of the \$\$ now directed to the hydrogen economy would be rightly invested in NH3. Fuel cells included"

"Improved policy for renewable NH3 production: investment tax credits, low/no interest loans, or require a small percentage be produced from renewable sources. Take risk out of constructing renewable ammonia plants, jump-start regional production"

17% ALLOW US TO MAKE SALES

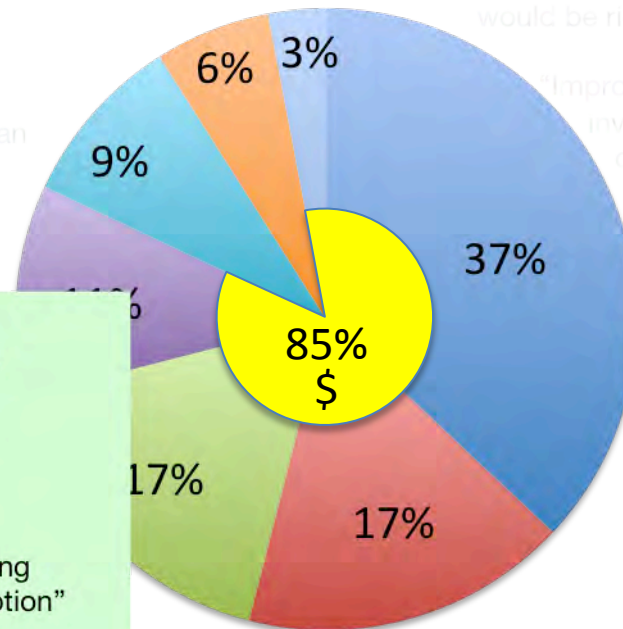
"Right now our potential clients do not accept NH3 as a legitimate fuel"

"If CARB would offer an RFP for a high efficiency / low emissions truck fleet ... they would get proposals"

17% CREATE A LEVEL PLAYING FIELD

"As with other alternative fuels (and batteries) government subsidies may be required. Fossil fuels are still too cheap"

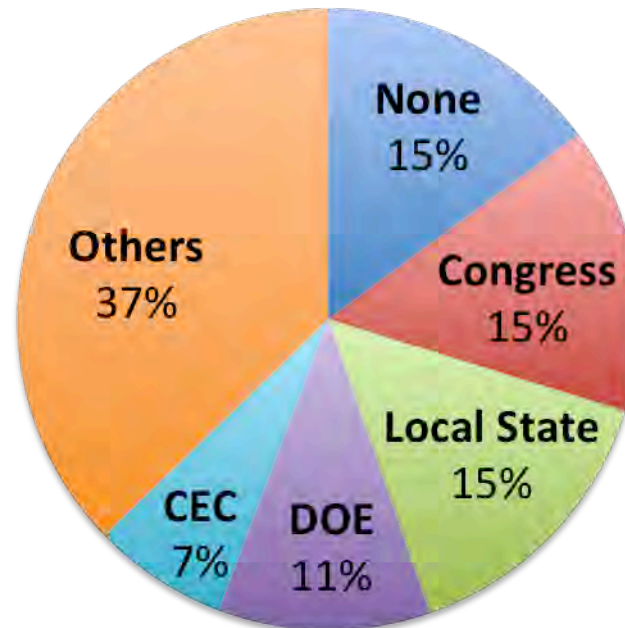
"Tax incentives (like \$7,500 EV credit). Get us back to a level playing field"



What agencies do we already reach?

OTHERS:

CARB
DOA
DOD
EPA
FEMA
NSF
OSHA
TSA



“There’s serious consideration at the federal level for ammonia SOFC research”

“We’re lobbying for other tech, not NH₃”

“As a public entity we are limited in our ability to advocate at the state and federal levels”

IS IT WORKING?

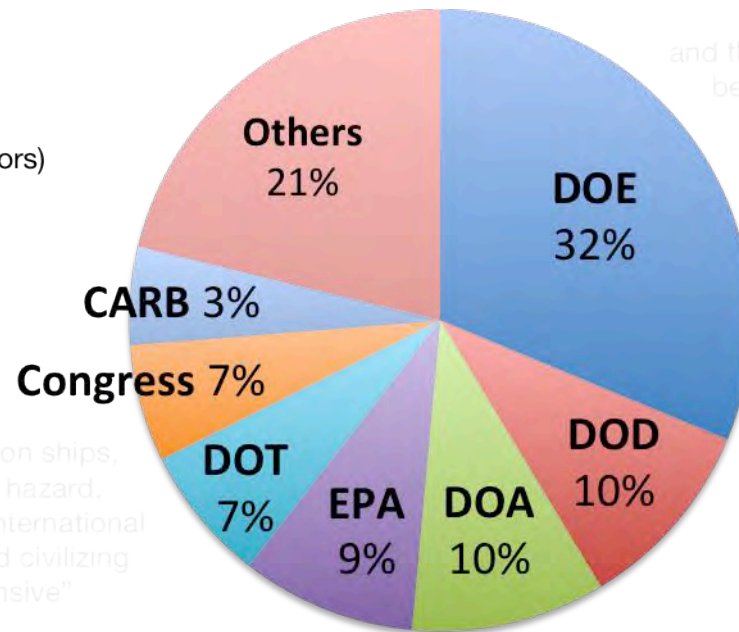
“Pretty useless – bureaucrats finding ways to say no to things”

“Achieved by logic: countering arguments (how safe, how expensive) standard objections, torn down with help of some representatives”

What agencies do we need to reach?

OTHERS:

- ARPA-E
- DOI
- IMO (Int'l Maritime Org)
- POTUS
- OSHA
- State / Local (Governors / Mayors)
- TSA



"DOE, because cracking DOE is just as hard as cracking CEC"

"Probably easier to nail CARB than DOE, and they may move it forward further than DOE because auto manufacturers take their lead. CARB - they're considered the standard. EPA would follow"

"CARB - first instinct as they've made most progress, but EPA too. But they're not funding groups, so DOE important. How to get all three agencies together? We should have a consistent message"

"DOE is most focused on funding BIG corps to do incremental development that doesn't solve energy issues, and that corps would fund themselves anyway"

"CEC is unduly influenced by CARB. Hydrogen is the only zero-carbon fuel CARB will bless. We are advised not to make a case AGAINST hydrogen but rather FOR liquid renewable fuels, as there is an 'all of the above' philosophy that gives an opening"

"IMO doesn't permit ammonia on ships, treats it as a fire and explosion hazard, which it isn't ... the national / international regulatory jungle. Exploring and civilizing this terrain is going to be expensive"

"High-level commitment to hydrogen forces all lower-level activity into supporting that path. Difficult to identify the source of that commitment ..."

"Military: they're the right people to be involved. Unique requirements, efficiency matters, long history of R&D. Will try projects that aren't ready for commercial markets"

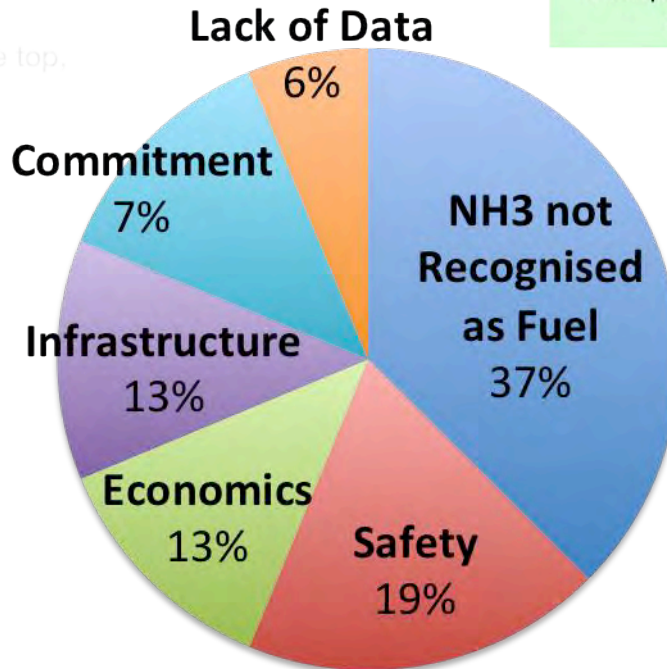
What are our gov't roadblocks?

"Lack of hard data to support case for NH3 fuel"

"No directive coming down from the top, or pressure from lobbyists"

"Lack of interest and funding in leapfrog solutions. Lack of belief in how practical it can be"

"Need some high-level visionary to take over, create directives for bureaucrats to enact. Elected people, not employees"



"Company has good relationship with DOE, such that they wouldn't want to risk it for NH3."

Government wants us to work on coal gas – some synergy with CO2 sequestration / natural gas"

"Don't want to risk our government relationships by advocating NH3 because the existing relationships are good"

"NSF, USDA, and DOT should stop sending all energy-related proposals to DOE for review"

"Acceptance of ammonia as a safe alternative"

"Fear of toxicity, perceived cost of new infrastructure"

What can we do to move gov't?

3% BRING IN THE NH3 INDUSTRY

"Businesses act if there's revenue; we haven't created a convincing picture for the NH3 industry. We need a more powerful voice in Washington. Politics only responds to big voices with big money"

7% DEVELOP POLICY

"Give seminars at National Labs (and expect opposition). Submit papers to DOE conferences. Publish in the peer-reviewed journals that DOE reads"

7% BUILD CONSUMER DEMAND

"Market pull affects DOE thinking – all the government can do is help"

17% FORM ALLIANCES

"With the Methanol Institute"

"Auto manufacturers: ask them to push it forward"

"Private sector. Big corporations and start-ups, for credibility to enable flexible thinking in government"

"Recruit major companies into a technology development alliance ... unseat hydrogen"

28% PROVIDE DATA

"Provide **emissions** testing data. Answer threshold questions: **low carbon** footprint, **economically competitive**, and prove it's **not so dangerous** that it's irresponsible to think about it"

"Internally, DOE thinks about other issues: toxic and expensive. We have to become technically very strong and argue that **these problems are solvable**. DOE will need to independently verify this"

21% DEMONSTRATION

"Get fuel running – engines in the field. Demonstrate more actual systems"

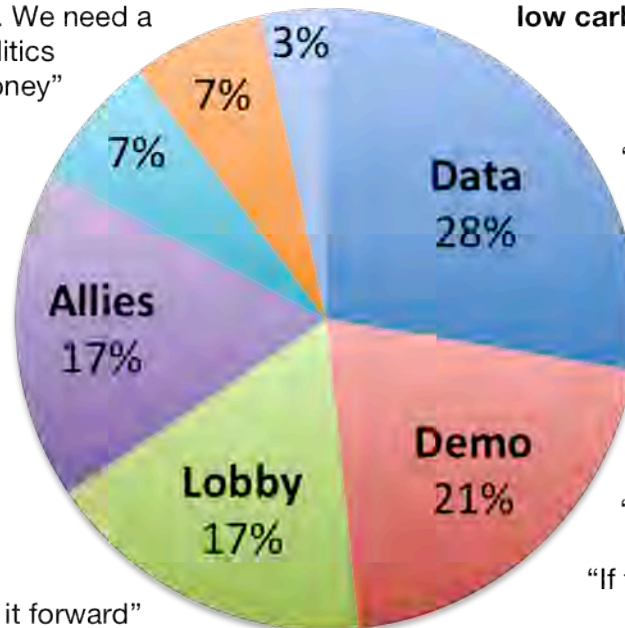
"Fleet or stationary, and DOE will perk up"

"If they can't kick the tyres, it's pure fantasy"

17% LOBBY

"Get legislators votes and campaign contributions: create pressure"

"Get more of a PR thing together: inform and engage. Let them know we exist, seed the ground. They're so busy, it's a rare soul who can see the what-ifs. Just let them know we're out there. What we're talking about is sensible"



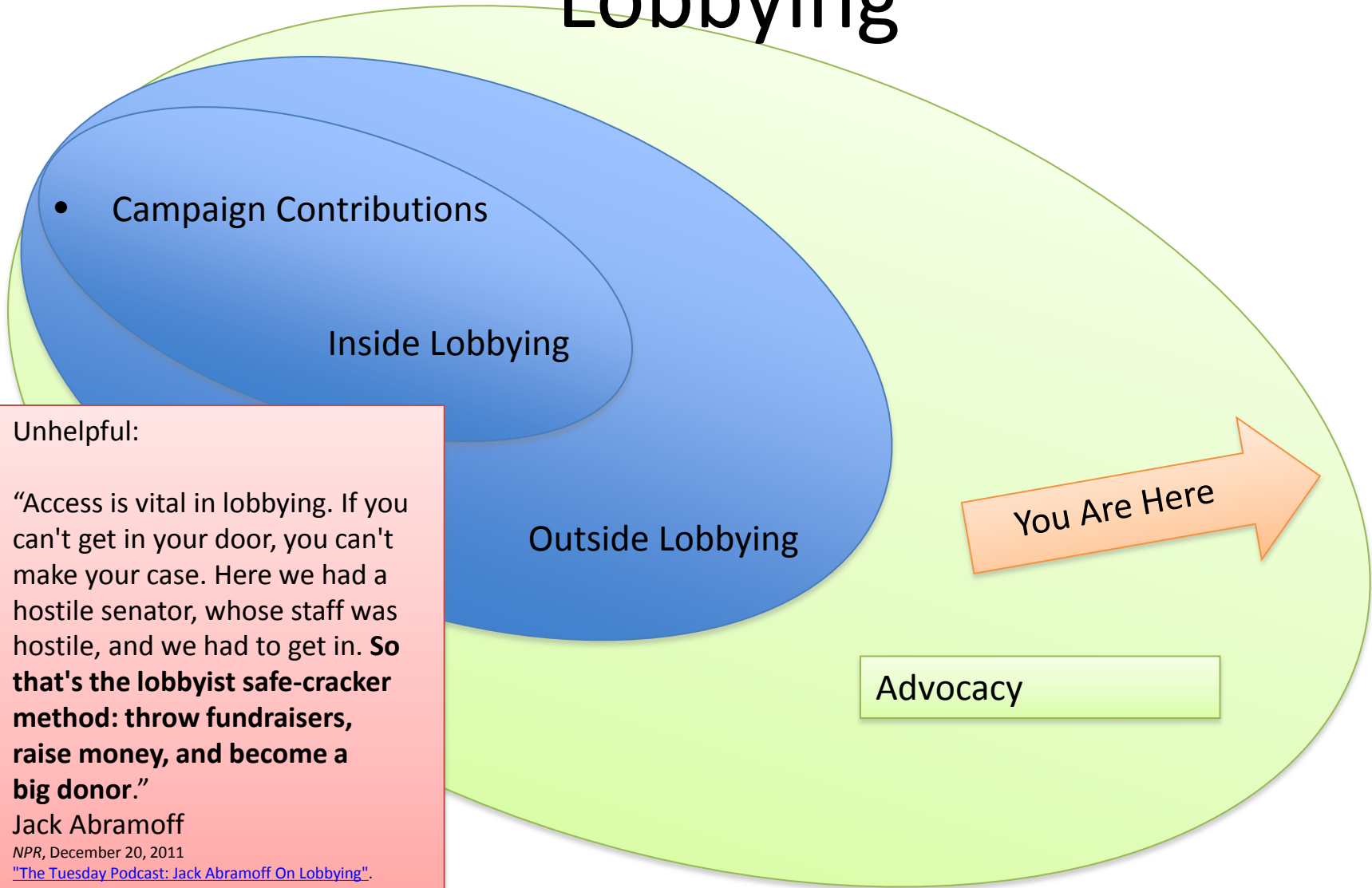
Part 2: So, What's Stopping Us?

- **Recognizing and Removing Obstacles**
... should also be **and Finding The Detours**
- Chicken or Egg?
 - Need Funding for Demo ... Need Demo for Funding
 - Need Demand for Product ... Need Product for Demand
- Do both
- Nothing is Stopping Us
- We know what we need to do
- We need to do it
- (Sorry if that's frustrating. I know it won't be easy.)

Part 2: So, What's Stopping Us?

- **Recognizing and Removing Obstacles and Finding The Detours**
- Practical Reality:
 - Make a plan
 - Specialization
 - Strategists / Managers: Innovation, Sustainability, Marketing
 - Communications / Social Media / Community Engagement
 - Computer Programmers
 - Lawyers / Lobbyists
 - Can't Afford to Hire? Academic Institution?
 - Use Students
 - Hire Fundraiser
 - Make Friends

Lobbying



Unhelpful:

“Access is vital in lobbying. If you can't get in your door, you can't make your case. Here we had a hostile senator, whose staff was hostile, and we had to get in. **So that's the lobbyist safe-cracker method: throw fundraisers, raise money, and become a big donor.**”

Jack Abramoff

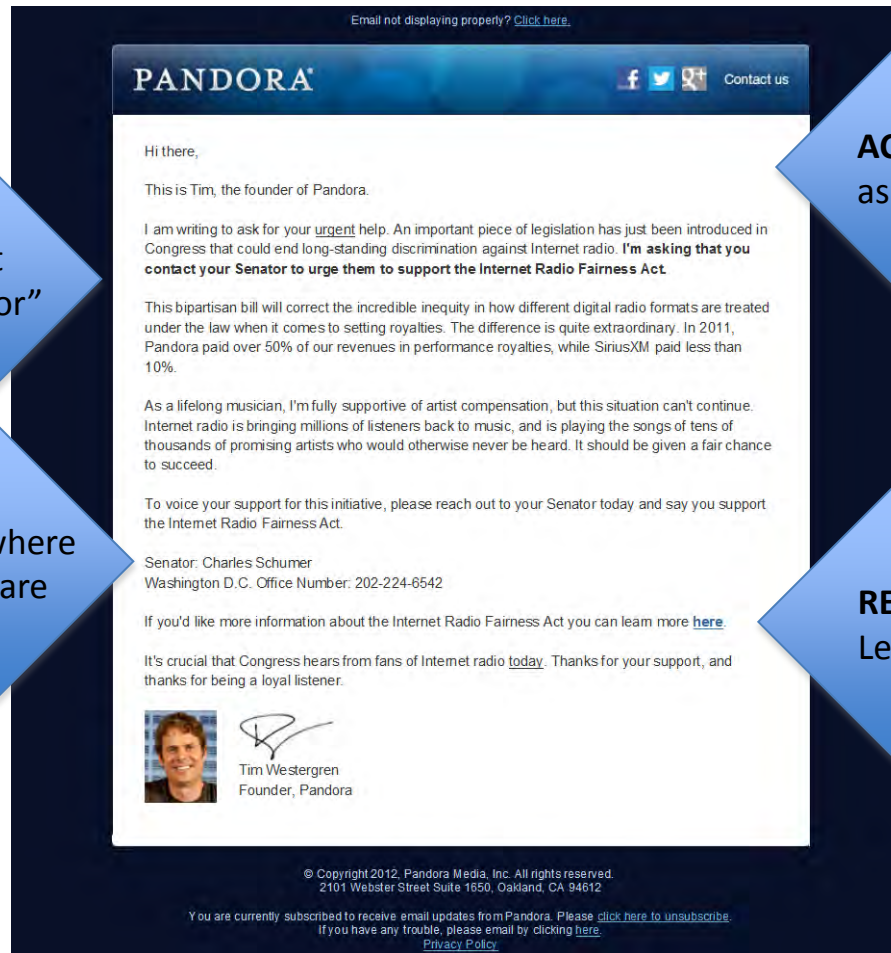
NPR, December 20, 2011

["The Tuesday Podcast: Jack Abramoff On Lobbying"](#).

Lobbying

- **Advocacy** = Communication + Information + Education
 - Public
 - Media / Influencers
 - Government
- **Lobbying** = Advocacy for/against **Specific Legislation**
- **Outside Lobbying** = talking to Media + Public
 - The Federalist Papers
- **Inside Lobbying** = talking to Government directly
 - Likely requires disclosures, registration, expenses
 - Non-Profit can't spend >20% budget.
 - Complicated rules but ANYBODY can lobby: just pick up the phone
- (Campaign Contributions = irrelevant)

Outside Lobbying



LOBBY! "I'm asking that you contact your Senator"

PERSONAL! Tim knows where I live + who my Senators are

ACTION! "I am writing to ask for your urgent help."

RESPECT! "Learn more here"
Let me make up my own mind

Personalized mass e-mail (I must have subscribed once) received from "Tim Westergren" tim.westergren@pandora.com on September 26, 2012

Outside Lobbying

OPEN FUEL STANDARD
 Welcome to the central action hub for all things concerning the vitally important legislation, The Open Fuel Standard Act.

Home | Welcome Page | Our Purpose | Inform Yourself | What You Can Do | Why the Bill is Urgent

SUBSCRIBE TO EMAIL UPDATES
 Enter your email address:

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WHAT YOU CAN DO NOW

1. Urge your Members of Congress to co-sponsor the bill ([click here to find out how to do it in three minutes](#)).
2. Subscribe to our email updates and share the emails with your friends and family ([click here to subscribe](#)).
3. "Like" the Open Fuel Standard Facebook page and "share" our Facebook posts with your Facebook friends and family ([click here to go to our Facebook page now](#)).
4. Educate yourself about the Open Fuel Standard ([click here to see recommended books, DVDs, and online videos](#)).
5. Print copies of the OFS Fact Sheet. Share them with friends and family, and use it for

Instability Linked to Oil Dependence
 FRIDAY, SEPTEMBER 28, 2012

In their book, *Turning Oil Into Salt, Gal Luft and Anne Korin explain why the Open Fuel Standard will change the world. If you haven't read it yet, you really should. And then share it with everyone you know. Here's an excerpt from the book:*

US embassy in Libya Sept 11th

Because most of the world's oil reserves are held by countries that are highly unstable, corrupt, dictatorial and in some cases hostile to the United States and its allies, oil's monopoly in the transportation sector is one of the most destabilizing factors in the international arena today.

For most of the 20th century, world oil supply was relatively uninterrupted, and the occasional conflicts and disruptions (the 1973 Arab Oil Embargo, the 1979 Iranian Revolution, and the 1990-91 Gulf War) were short lived and relatively contained. They certainly did not merit a fundamental change in our energy system. But in recent years, it has become increasingly apparent that the world is facing a "perfect storm" of security and economic problems all directly linked to our oil dependence.

Print Friendly
 Email this • Email the author • Stumble It! • Add to del.icio.us
 Posted by Abe Shackleton at 11:52 PM

CO-SPONSORS
 Click for co-sponsors in the House
 Click for co-sponsors in the Senate

THE BILL ITSELF
 Click here to read a PDF document of the text of the House bill.
 Click here to read the text of the Senate bill.

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- Methanol Institute
- American Coalition for Ethanol
- US Energy Security Council
- ... et al

<http://www.openfuelstandard.org/>

- ACT
- SUBSCRIBE
- PARTICIPATE
- LEARN
- SPREAD THE WORD

TRANSPARENT original source

PERSONAL & PARTICIPATORY "E-mail the author"

Inside Lobbying

- You can send books
as long as inside cover is inscribed with the recipient's name and the name of your organization
- You can give awards
- Known quantity: www.OpenSecrets.org
Last year, one of us spent \$520,000
Exxon spent \$12,730,000
- Does the investment pay back?
Strategas index:
Outperformed S&P500 by 11% a year since 2002
<http://www.economist.com/node/21531014>
- Success rate per bill:
Lobbyists LOSE 50% (by definition)
so **don't be totally daunted**
- Easiest victory: DELAY



Opposition

- British innovator & entrepreneur
- Alternative fuel vehicles for public transport
- Charged less than the competition
- Existing businesses lobbied
- Parliament taxed the fuel
- Bankrupted the business

- Year: 1830s
- Lobby Group: horse drawn carriage industry
- Alternative Fuel: steam
- Entrepreneur: Goldsworthy Gurney
- **Inventor of the first ammonia engine (?)**
- “Mr. Goldsworthy Gurney ... made an ammonia engine—probably the first ever made—and worked it so successfully, that he made use of it in driving a little locomotive.”

A History of The Growth of The Steam-Engine by Robert H. Thurston http://en.wikipedia.org/wiki/Goldsworthy_Gurney



Opposition: A Known Quantity

- **Manufactured uncertainty**
Raising doubts about even the most indisputable scientific evidence.
- **Information laundering**
Using seemingly independent front organizations to publicly further its desired message and thereby confuse the public.
- **Promoted spokespeople who misrepresent ...**
... Peer-reviewed scientific findings or
Cherry-pick facts or otherwise ...
Persuade the media and the public that there is still debate among scientists
- **Shift the focus away from meaningful action**
Misleading charges about the need for “sound science”
- **Extraordinary access to government**
Block federal policies, shape government communication
- **“Unless ‘climate change’ becomes a non-issue, meaning that the Kyoto proposal is defeated and there are no further initiatives to thwart the threat of climate change, there may be no moment when we can declare victory for our efforts.”**

Internal memo “discussion item within Shell” re the global warming campaign by the American Petroleum Institute, April 1998
from page 40 of Union of Concerned Scientists – “Smoke, Mirrors & Hot Air”

http://www.ucsusa.org/assets/documents/global_warming/exxon_report.pdf

Is this report real or fabricated? I don't know.



Doubt & Misinformation

- “We’re not going to let our campaign be dictated to by fact-checkers”
Neil Newhouse said at a panel organized by ABC News
http://www.huffingtonpost.com/2012/08/23/mitt-romney-_n_1836139.html
- “Are there mistakes that are made, areas where **there is no doubt** that somebody could dispute how we are presenting things? You know, that happens in politics.”
President Barack Obama said on “60 Minutes,” CBS
http://www.cbsnews.com/8334-504803_162-57518524-10391709/unaired-excerpts-from-the-obama-romney-interviews/?pageNum=10
- On Global Warming:
21% of Americans trust Mitt Romney
47% trust Obama
George Mason University, Center for Climate Change Communication / Yale University, School of Forestry & Environmental Studies, March 2012
<http://www.climatechangecommunication.org/images/files/Climate-Beliefs-March-2012.pdf>
- This is empowering: transparency

Cheat Sheet 1:

10 Reasons Why People Resist Change

- **Loss of control**

Power and status, but also self-determination

- Empower: let people make choices
- Give them ownership: involve in planning

- **Excess uncertainty**

Better the devil you know ...

- Create a sense of safety: certainty in process
- Steps and timetables
- Inspire, so that the reward is worth the risk

- **Surprise**

Decisions imposed suddenly, no time to prepare

- Plant seeds: hint and seek input

- **Everything seems different**

Too many changes, confusing / distracting

- Minimize the number of differences
- Keep as many things as possible familiar
- No change for change's sake

- **Loss of face**

Those associated with the past are likely to be defensive, dread the perception that they must have been wrong.

- Maintain dignity by celebrating the past
- Emphasize world has changed: let go, move on

- **Concerns about competence**

People feel stupid / obsolete: skepticism

- Structural reassurance: information, education, training, support systems
- A period of overlap to ease transition

- **More work**

But we just built that one! Now you want us to ...

- How to motivate?
- How to reward sacrifice?

- **Ripple effects**

Disruption out of scope: pushback, rebellion against interference

- Consider all affected parties, however distant
- Engage with them to minimize disruption

- **Past resentments**

Risk management: old wounds, personality clashes

- Gestures to heal the past
- Reputation management

- **The threat is real: it's a zero sum game**

New displaces old: investments wiped out, jobs lost.

- Be honest, transparent, fair, and fast

Adapted from Rosabeth Moss Kanter, Harvard Business School, author of "Confidence" and "SuperCorp," <http://blogs.hbr.org/kanter/2012/09/ten-reasons-people-resist-change.html>

Cheat Sheet 2:

Are You Hurting Your Own Cause?

- **The Black and White scenario**
Idealize / Demonize ... creates impasse
Don't try to scare people into following our vision
- **Uninvited opinion**
Instead, use positive engagement
Create reasons for people to seek out your expertise
- **Assuming you know others' opinions**
Aiming to re-educate can appear fanatical
Undermines credibility
- **Ad Hominem**
Honey v vinegar
- **Sticking to the script**
One tune, all the time, not listening, not learning.
- **Why are other people so damn bureaucratic?**
Because we don't see what they see, understand their reality
So we get frustrated
- **Conclusion: Strategic engagement**

Adapted from http://blogs.hbr.org/cs/2012/09/are_you_hurting_your_own_cause.html
Image source: <http://grist.org>

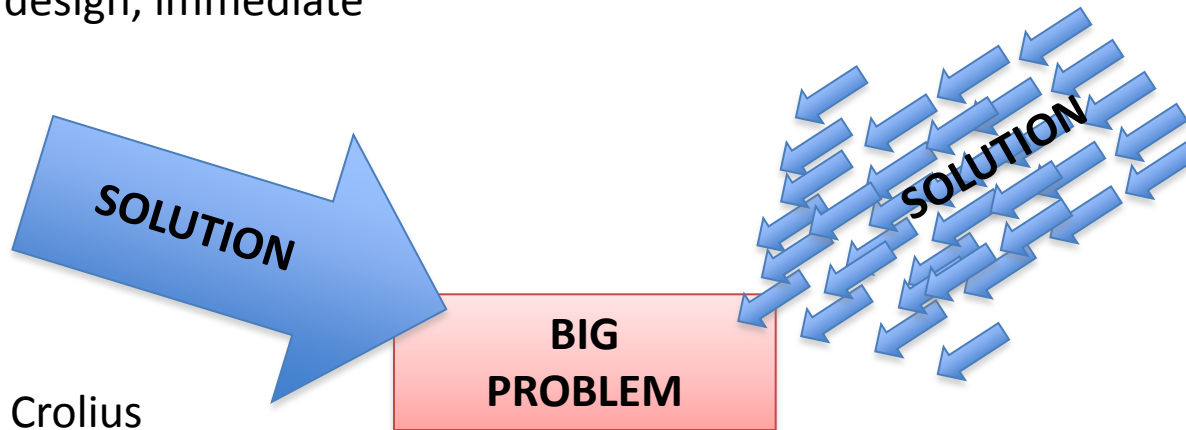


The Mythical Place

- **A Practical, Actionable Plan**
- **“A mythical place ... It is stable, democratic, peaceful, prosperous, inclusive and has extremely low levels of political corruption.”**
Francis Fukuyama, Stanford professor
- (Denmark)
- **“How is it possible to whisk such an initiative through parliament, the courts and company boardrooms in a way that makes the population see its advantages? How do you plant a major technological innovation in people’s minds?”**
Richard Vanderveen, Wind Resources LLC
<http://cleantechnica.com/2012/09/28/communities-do-change-the-world>
<http://www.midwestenergynews.com/2012/06/08/michigans-largest-wind-farm-goes-online/>
- **The Command Economy**
- **Live in a Democracy? Need Government to Act? Government at an Impasse?**

Carpets

- **Wall-to-wall carpets:**
First item ordered, longest lead time
- **Carpet tiles**
Modular design, immediate



See:
Stephen Crolius
Clinton Climate Initiative
“The Simple Molecules Strategy”
10/1/2012, 4.30pm

Sustainability



- **Ray Anderson, Interface**

World's largest designer and maker of carpet tile

Petroleum intensive. Sales in 110 countries, manufacturing on 4 continents

- “The industrial system is destroying the planet and **only industry leaders are powerful enough to stop it**”

- **Goals:**

stop “**accelerating** the rate that we **draw down** capacity”

stop “buying or degrading **other people’s** environment”

stop “displacing other species by **taking** over their habitats”

“The Ecology of Commerce” (1993) by Paul Hawken, <http://www.paulhawken.com/>

- **Interface increased sales, doubled profits**
Reversed “take / make / waste”

Ray Anderson, *Confessions of a Radical Industrialist: Profits, People, Purpose: Doing Business by Respecting the Earth* (2009, paperback 2011 under the title: *Business Lessons from a Radical Industrialist*). See his TED talk “The business logic of sustainability” (May 2009) here: http://www.ted.com/talks/ray_anderson_on_the_business_logic_of_sustainability.html
<http://www.interface.com/>
<http://www.raycandersonfoundation.org/>

1st Industrial Revolution

$$I = P \times A \times T_1$$

I = Environmental Impact
P = Population
A = Affluence
T = Technology

2nd Industrial Revolution

$$I = \frac{P \times A}{T_2}$$

I = Environmental Impact
P = Population
A = Affluence
T₂ = Technology of the Future

The New Civilization

$$I = \frac{P \times a}{T_2 \times H}$$

I = Environmental Impact
P = Population
a = Affluence
T₂ = Technology of the Future
H = Happiness (satisfying all basic human needs)

If gov't did one thing?

- **Carbon Policy**
- **Specifically: adjust discount rate down from 3.5%, closer to 1.4%**
- **“Internalize the Externalities”**
- **How much damage will one ton of CO2 do?**
- **What is it worth to avoid this?**

Social Cost of Carbon

- **Richard Tol**

The Economic Effects of Climate Change

Journal of Economic Perspectives—Volume 23, Number 2—Spring 2009—Pages 29–51

http://www.econ.yale.edu/~nordhaus/homepage/documents/Tol_impacts_JEP_2009.pdf

- **US Gov't 2010: \$21 per ton CO2**

- **Gov't wrong: 2.6 to >12 times higher (new paper)**
\$55 - \$266 per ton CO2

Laurie Johnson (Natural Resources Defense Council) and Chris Hope (Judge Business School, University of Cambridge)
"The social cost of carbon in U.S. regulatory impact analyses: an introduction and critique"

Journal of Environmental Studies and Sciences, September 2012

<http://www.springerlink.com/content/863287021p06m441/fulltext.html?MUD=MP>

- **EU: now at record low of ~5 Euros per ton**
China: 12th 5 Year Plan: reduce CO2 by 17%
Aviation Fuels: EU – China – now USA too

- And in the meantime ...

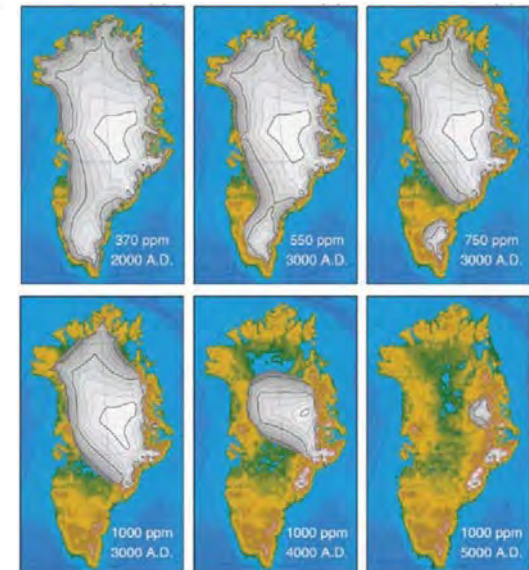
"Whoever has control of the Arctic route will control the new passage of world economics and international strategies"

Li Zhenfu, Dalian Maritime University, quoted by Linda Jakobson, Stockholm International Peace Research Institute survey, The Economist, September 1, 2012

Table 2
The Social Cost of Carbon
(measured in \$/tC)

	Sample (unweighted)				Fitted distribution (weighted)			
	Pure rate of time preference				Pure rate of time preference			
	All	0%	1%	3%	All	0%	1%	3%
Mean	105	232	85	18	151	147	120	50
Standard Deviation	243	434	142	20	271	155	148	61
Mode	13	—	—	—	41	81	49	25
33 rd percentile	16	58	24	8	38	67	45	20
Median	29	85	46	14	87	116	91	36
67 th percentile	67	170	69	21	148	173	142	55
90 th percentile	243	500	145	40	345	339	272	112
95 th percentile	360	590	268	45	536	487	410	205
99 th percentile	1500	—	—	—	1687	667	675	270
N	232	38	50	66	—	—	—	—

Note: Numbers in the table show the social cost of carbon measured in 1995 dollars per metric ton of carbon (\$/tC). Estimates are based on sample statistics and characteristics of the Fisher-Tippett distribution fitted to 232 published estimates and to three subsets of these estimates based on the pure rate of time preference.



Carbon in the US ...

- “The governmental working group used a very empirically based discount rate, which **seems very concrete**, but over the long term runs into an **ethical brick wall**.”
- A human life is often estimated to be worth around \$10 million, but if you apply a three percent discount rate to this, that means that a human life five hundred years from now is only worth \$3.81 today.
- Ultimately, we can't rely on only numbers — we have to make really hard value judgements. We should stop pretending this is a science and admit it is an art and talk about this in terms of **ethics and fairness, not what we can observe in the markets.**”

Frank Partnoy, professor of Law and Finance, University of San Diego

<http://green.blogs.nytimes.com/2012/09/18/the-social-cost-of-carbon-how-to-do-the-math/>

- **“The art of reimagining the epic face-palm of a fail you and I call the status quo”**

Udair Haque, http://blogs.hbr.org/haque/2012/09/if_you_were_the_next_steve_job.html

... is our Market Opportunity

- “Only industry leaders are powerful enough” (Ray Anderson)
- **CREX**
Global Corporate Renewable Energy Index (CREX), 2012
Bloomberg New Energy Finance / Vestas Wind Systems A/S
http://www.businessgreen.com/digital_assets/5821/CREX_report_2012.pdf
- “Much of the demand for renewable technologies **has been** driven by specific energy policies. But there is also a **growing awareness** of the benefits of generating and using clean energy **over and above the incentives provided by governments**, especially among corporate energy users”
- “Companies are increasingly **shifting the focus** of their sustainability strategy from energy efficiency to **renewable energy**”
- “Companies ... calling for an **expansion in regulatory support** for renewable energy, through mechanisms such as liberalising power markets, supporting incentive schemes or taxes on carbon dioxide emissions”

... is our Market Opportunity

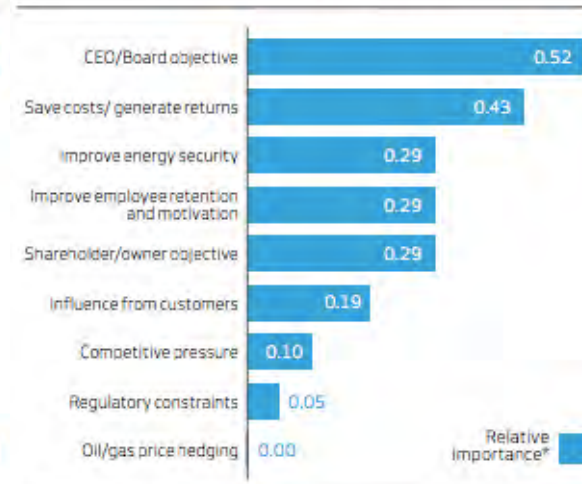
- I disagree with conclusions of Bloomberg's CREX Report ...
 Uses the word "Marketing" 19 times
 Uses the word "Profit" only 4 times

Figure 7: Reasons for voluntary procurement of renewable energy (Global), 2011



Source: Bloomberg New Energy Finance.
 *The 'relative importance' for each reason was calculated by dividing the frequency of that reason by the total number of respondents to this survey question (150).

Figure 8: Reasons for voluntary procurement of renewable energy among companies procuring at least 50% renewable energy, 2011



Source: Bloomberg New Energy Finance.
 *The 'relative importance' for each reason was calculated by dividing the frequency of that reason by the total number of respondents to this question that obtained at least 50% of their power from renewable sources (21).

1. CEO / Board
2. Save / Profit
3. "Security" ie less risk
4. Talent: beat competition
5. Shareholders
6. Customers
7. Competition
9. Hedge

Global Corporate Renewable Energy Index (CREX), 2012
 Bloomberg New Energy Finance / Vestas Wind Systems A/S
http://www.businessgreen.com/digital_assets/5821/CREX_report_2012.pdf

... is our Market Opportunity

- Intel
- “Since 2008, we have **linked a portion of every employee’s variable compensation**—from front-line employees to our CEO—to the achievement of environmental sustainability metrics. The 2011 metrics focused on **carbon emission reductions** in our operations...”
- Puma:



PRESS KIT

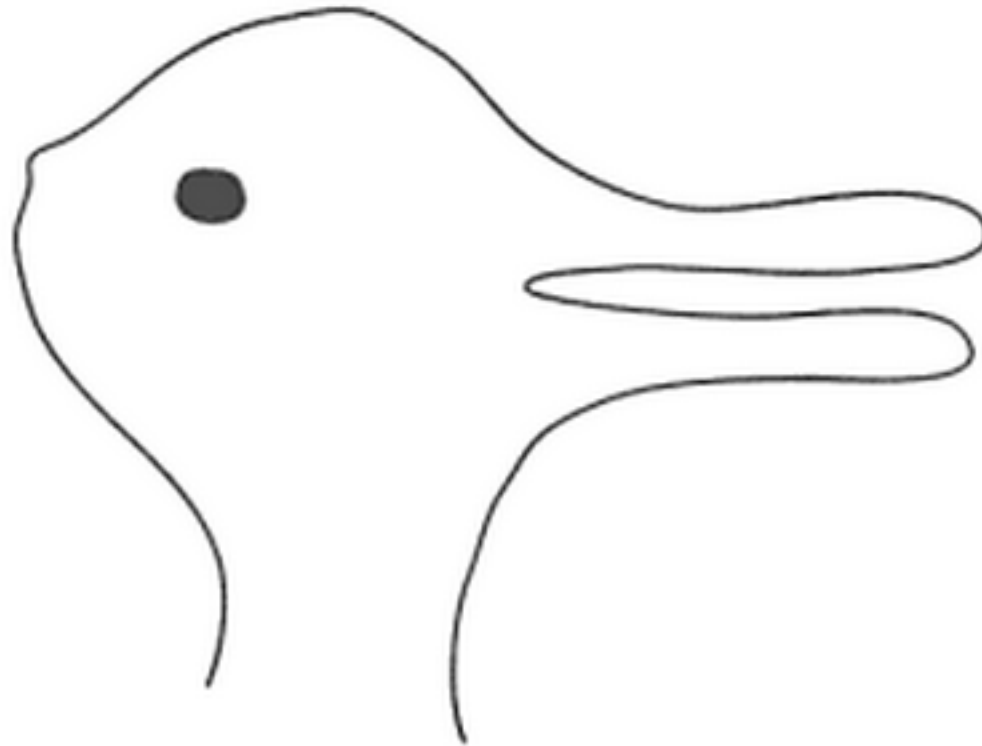


PUMA E P&L Table & Visual Break-Down

	Water use	GHGs	Land use	Air pollution	Waste	TOTAL	
	€ million	€ million	€ million	€ million	€ million	€ million	% of total
	33%	32%	26%	7%	2%	100%	
TOTAL	47	47	37	11	3	145	100%
PUMA operations	<1	7	<1	1	<1	8	6%
Tier 1	1	9	<1	1	2	13	9%
Tier 2	4	7	<1	2	1	14	10%
Tier 3	17	7	<1	3	<1	27	19%
Tier 4	25	17	37	4	<1	83	57%
EMEA	4	8	1	1	<1	14	10%
Americas	2	10	20	3	<1	35	24%
Asia/Pacific	41	29	16	7	3	96	66%
Footwear	25	28	34	7	2	96	66%
Apparel	18	14	3	3	1	39	27%
Accessories	4	5	<1	1	<1	10	7%

Change the Debate: What Story? What Storyteller?

- **Jim Gandy: WLTX TV weatherman in South Carolina**
- “I’m not from a red state, I’m from a dark red state”
- Gandy began speaking out about climate change fully prepared to face **backlash from his politically conservative audience**. But a funny thing happened: The backlash never came. Rather than facing an onslaught of angry phone calls, Gandy found that many **viewers were fascinated by his reports connecting climate change with their daily lives.**
<http://grist.org/climate-energy/meeting-the-bruce-springsteens-of-climate-communication/>
By Jordan Haedtler, Campaign associate with <http://ForecasttheFacts.org>
“Seeks to ensure Americans receive accurate information about climate change.”
- **Duck**



Changing the Story

- **Energy & Enterprise Initiative**
Bob Inglis (former R-SC)
- “Economists have long understood that the key to smart environmental policy is aligning private incentives with true social costs and benefits. That means putting a price on carbon emissions, so households and firms will have good reason to reduce their use of fossil fuels and to develop alternative energy sources.”
- A Free-Enterprise Solution ... conservative principles ...
 - Eliminates all subsidies for all fuels
 - Attaches all costs to all fuels
 - Ensures revenue neutrality to prevent the growth of government

Changing the Story

- **“Stories are more powerful than data** because they allow individuals to identify emotionally with ideas and people they might otherwise see as ‘outsiders’”
- **“It is not the objective world that influences us but how we represent and interpret the world”**
- **“Redirect” by Timothy Wilson**
The Surprising New Science of Psychological Change, Sept 2011, by Timothy D. Wilson (University of Virginia)
http://www.hachettebookgroup.com/books_9780316051880.htm
- **“A scientifically-based approach called story editing: redirecting the stories we tell about ourselves and the world around us, with subtle prompts, in ways that lead to lasting change.”**

How do we turn our story to action?

- **Mobile Phone: access**
 - universal
 - distributed
 - democratic
- **Social: organize**
 - portable
 - personal
 - participatory
- **Big Data: transparency**
 - everything
 - immediate
 - better stories



How do we turn our story to action?

- **Frugal Innovation / Minimum Viable Product**

Feedback (listening)

Product development

Build Customer Base

Publicity

Cashflow

- Tata nano: \$2,000

- M-PESA: Mobile Banking:
70% transaction market in Kenya

The image shows a screenshot of a Kickstarter campaign page for 'LIFX: The Light Bulb Reinvented' by Phil Bosua. The page features a large image of a white LED light bulb on the left and a smartphone displaying a color control app on the right. A 'PLAY' button is overlaid on the smartphone image. To the right of the images, the campaign statistics are displayed: 8,861 backers, \$1,312,255 pledged of a \$100,000 goal, and 46 days to go. A green 'Back This Project' button with a '\$1 minimum pledge' is visible. Below the main image, there is a social media sharing section with 'Like' and 'Twee' buttons, and a description of the product: 'LIFX is a WiFi enabled, multi-color, energy efficient LED light bulb that you control with your iPhone or Android.' The page also shows the launch date (Sep 15, 2012) and the funding end date (Nov 14, 2012).

How do we turn story to action?

- **“Collaboration is the new competition”**

Andrew Liveris, CEO Dow Chemical

Quoted by Ben Hecht, President & CEO of Living Cities

<http://www.fastcoexist.com/1680570/5-transformational-forces-that-should-be-driving-the-social-sector-but-aren-t>
<http://www.livingcities.org/>

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 - Tap our experts for a Premium Challenge
 - Build a transformative Grand Challenge
- Drive Growth & Return-On-Innovation**
 - Harness our cloud-based platform
 - Develop and train your teams
 - Build your open innovation strategy
- Join Our Community of Problem Solvers**
 - Solve Challenges for cash awards
 - Find teammates and collaborate
 - Earn recognition and badges

What is InnoCentive? Watch!

INNOCENTIVE®

OPEN INNOVATION
BEING
PETITIONS

Leave the beach & hit the ground running.

Run a challenge. Or run three.
We have a deal you won't pass by.

ACT NOW >>

Offer Valid through September 30, 2012. Terms and conditions apply.

The Latest

All In the News Events PR

- News Innovating our Way to the Future: Dwayne Spradlin's Speech at TEDxHelvetia
- News Harvard Business Review: The Power of Defining the Problem
- News Health Data Consortium Interview with InnoCentive CEO Dwayne Spradlin

How do we turn story to action?



Slavery Footprint: using the Free Market to Free People

It all began with Justin Dillon, a onetime musician who got involved in the anti-slavery movement hosting benefit concerts. Justin made abolitionism his full-time job, making his directorial debut in the human-trafficking documentary, "CALL+RESPONSE." The **U.S. State Department** saw the film and approached Justin for his help developing a narrative that would allow individuals to understand their connection to modern-day slavery. From that conversation, Slavery Footprint was born. On September 22, 2011, Slavery Footprint launched a website that asked a single question: "How Many Slaves Work For You?" The response was so overwhelming that our site couldn't keep up with the traffic. Since then, millions of people from 200 countries have visited www.slaveryfootprint.org

Take Action. Make Progress. Get the App.
 Free world points mark your contribution to ending slavery. Earn points when you use the app to tell brands you care, retailers you'd pay more for slave-free goods, & your community about the issue. You can also get started right here:

Send a Message Recruit Share Donate Lobby Volunteer Analog Actions

To: Pama
 Message that will be sent: [Click to Change](#)

Dear Pama,
 I like your company and I'd love to keep buying your stuff. That's why I'm writing to you about modern-day slavery in many supply chains.
 There are over 27 million slaves worldwide mining, farming, catching, and manufacturing the products I buy.
 I'm asking you to join me in tracing my money all the way back to the people that most need its influence.
 I've made myself transparent by taking the Slavery Footprint survey and telling everyone I know how many slaves' lives I am responsible for. I'm asking you to join me by independently assessing your supply chains for forced labor.
 Please email info@slaveryfootprint.org to find out more. We all want to live in a Free World.
 Thank you,
 [your name will be here]

First name: Trevor Last name: Brown Email: slaveryfootprint@trevorbrown.us [Send 1 Free World Point](#)

Take Action. Make Progress. Get the App.
 Free world points mark your contribution to ending slavery. Earn points when you use the app to tell brands you care, retailers you'd pay more for slave-free goods, & your community about the issue. You can also get started right here:

Send a Message Recruit Share Donate Lobby Volunteer Analog Actions

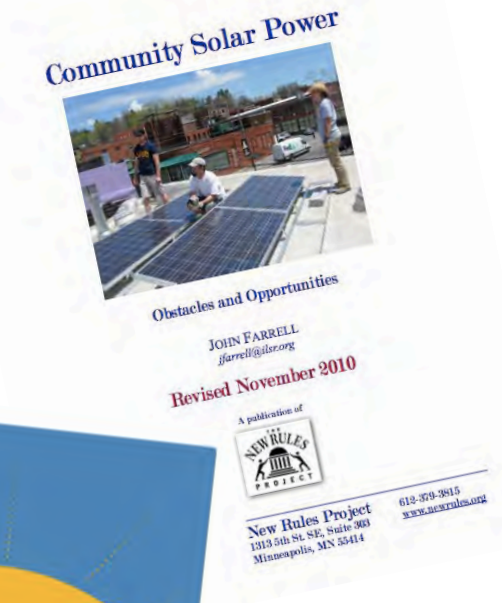
Our goal is to send 1,000 letters to the apparel industry this week! Tell them you want to know about the use of modern-day slavery in their supply chains. We've already written it for you, start by picking your favorite clothing brands below. This is your moment to impact an industry.

A

Andia Napa Valley	Anvil Knitwear	Aquila	Apple	Apple Bottoms	Applebee's
Aprica	Aqua Net	AquaNet	aramis	Arbor Mist	Arby's

Get Distributed

- “Distributed”
 - Generation
 - Ownership
 - Delivery
- Energy Democracy
 - Leasing
 - Community Ownership
 - Power Purchase Agreement



Distributed Capitalism

- Total Energy USA conference

Houston, Nov 27-29

<http://totalenergyusa.com/>

- **Keynote 1:**

A New Energy System: The Internet, Renewable Energy, Distributed Generation, Power Plant Buildings and New Vehicles

- “When **distributed communication converges with distributed energy generation**, a new energy regime will be created, loaded by buildings, partially stored in the form of hydrogen, distributed via smart intergrids and connected to plug in zero emission transport. The entire system is interactive, integrated and creates new cross-industry relationships. **There will be a new era of “distributed capitalism” in which millions of existing and new businesses and homeowners become energy players”**

The screenshot shows the Total Energy USA conference website. At the top, it says "TOTAL ENERGY USA" with a colorful logo, "November 27-29, 2012 HOUSTON, TEXAS" and "George R. Brown Convention Center". Below this is a paragraph of text: "Now, there's a professional conference and expo that paints the complete picture. Total Energy USA assembles all the energy sectors - fossil, renewable and nuclear - to give you a comprehensive look at different energy solutions that will generate energy business and help to address today's energy challenges. In an event focused on how businesses are impacted by energy and designed to open new opportunities, you will have access to the latest information, the newest technologies and the best industry connections. Use this groundbreaking event to advance your organization and ensure your future on the total energy landscape." Below the text are links for "Schedule", "Speakers", and "Attendees". On the right side, there are social media icons for mobile, email, Twitter, and Facebook. Below the icons is a search bar and a "Connect with Us" section. The main content area shows the date "Tuesday, November 27" and a keynote titled "Keynote 1 - A New Energy System: The Internet, Renewable Energy, Distributed Generation, Power Plant Buildings and New Vehicles". The keynote text reads: "When distributed communication converges with distributed energy generation, a new energy regime will be created, loaded by buildings, partially stored in the form of hydrogen, distributed via smart intergrids and connected to plug in zero emission transport. The entire system is interactive, integrated and creates new cross-industry relationships. There will be a new era of 'distributed capitalism' in which millions of existing and new businesses and homeowners become energy players." On the right side of the keynote text is a "Connect with Us" section with a search bar and a list of topics: "Nov 27-29, 2012", "Venue", "ACORE Regional Roundtable", "Biomass", "Break", "Coal", "Expo Hall Hours", "Geothermal", "Hydrogen", "Hydropower & Water", and "Infrastructure".

Distributed Capitalism

- In the meantime: local

'Clean, green, economical, off grid power generation'

diversenergy

About us The PowerCube Partners News

Market overview

"In some parts of Africa cell tower (BTS) operators are reporting that power costs can be as high as 50% of total OPEX where diesel is the main power supply." - ABI Report "Mobile Networks Go Green 2008"

High diesel prices. Theft. Maintenance issues. Telecommunications providers in developing countries face a myriad of challenges as they push their networks out beyond the existing electricity grid to service the rapidly growing demand for cellular communications. Diesel generators have been the solution of choice in most off-grid BTS applications, until now.

Interested?
Contact us to now find out more...

"In 2009, over 800,000 base stations will utilize alternative energy solutions." - ABI Research, March 2009

The pressure for cleaner and more economical BTS power solutions has clearly reached the tipping point. In response to this market challenge, Divers Energy has developed the PowerCube®, an anhydrous ammonia-fueled, base-load fuel cell power system that replaces diesel generators at remote telecom sites. No more lengthy site surveys, battery problems, security issues, or sub-optimized diesel installations.

The PowerCube® is now ready to serve off-grid telecom needs throughout the world, delivering rapid no-compromise deployments, substantial OPEX savings over diesel generators, and a two year payback, all with exceptional environmental credentials.

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BALLE | BE A LOCALIST

ABOUT CONNECTING LEADERS SPREADING SOLUTIONS

BUILDING REAL PROSPERITY

02:29

vimeo

www.bealocalist.org

<http://evergreencooperatives.com/>

BUILDING LOCAL ECONOMIES

Evergreen COOPERATIVES

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Evergreen Cooperatives

The Evergreen Cooperatives of Cleveland, Ohio are pioneering innovative models of job creation, wealth building, and sustainability. Evergreen's employee-owned, for-profit companies are based locally and hire locally. They create meaningful green jobs and keep precious financial resources within the Greater University Circle neighborhoods. Worker-owners at Evergreen earn a living wage and build equity in the firms as owners of the business.

Evergreen Cooperatives 2012

Share More info

MARY DONNELL
GREEN CITY GROWERS

0:00 / 6:24

Conclusion ...

- **“Good decisions depend on good measurement.** More subtly, what we decide to measure, or are able to measure, has important effects on the choices we make ...
- Economics ... the allocation of scarce resources. That definition may be the ‘what,’ but it **certainly is not the ‘why’** ...
- The ultimate purpose of economics, of course, is to understand and promote the enhancement of well-being. **Economic measurement** accordingly must encompass measures of well-being and its determinants”

Ben Bernanke, Federal Reserve Chairman, speaking to the International Association for Research in Income and Wealth, August 6, 2012
<http://www.federalreserve.gov/newsevents/speech/bernanke20120806a.htm>

- Why has none of it happened? Sustainable industry, Distributed Capitalism ...
- **“There must be a clear alternative”** Ray Anderson
- I think it’s you guys

Next Year

- This year, theory
- Next year, results

“Hope is not the conviction that something will turn out well,
but the certainty that something makes sense,
regardless of how it turns out.”

Vaclav Havel