Carbon Pricing: Signs of Bipartisanship

David Carlson
Ethics and Ecological Economics Forum
February 26th, 2018
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PART 4: Limitations of Carbon Pricing and the Need for Carbon Dioxide Removal

Paul Belanger and Ron Larson

ILIFF School of Theology, Denver CO
February 2018

PART 4: LET'S START WITH LIMITATIONS

- PROPOSED Amount of Pricing Is NOT Enough
  - Would $0.33/gallon gas going to change your habits?
  - Maybe $2.00 to $4.00 / gallon will? BUT
  - ….and stop the economy
- NEVERTHELESS:
  - Prudent to Start Acting and Impose Pricing to Discourage Fossil Fuel Use and REDUCE Emissions
  - AND Simultaneously Ramp Up More Sustainable and Ethical Practices in our Lives!

Proposed TAX INCREASE of 25 Cents/Gallon of Gas Earmarked to Shore-up Highway Infrastructure HAS RESISTANCE!

GAS TAX

Koch groups: Rise would hit Trump states hardest

By John Car-
Bloombe

CONCLUSION: Added Fee NOT Likely to Pass!

A fede fac-
to help per-
U.S. ro cur-
would fa ac-
ups:

won by Donald Trump in 2016, according to a report released Tuesday by two groups tied to the billionaire Koch brothers that oppose the increase.

Looking for tax increase for roads – already an uphill battle!

The impact of raising the gas tax by 25 cents per gallon, as the U.S. Chamber of Commerce has suggested

won nine.

"Every American stands

the two organizations, part of the political network led by Charles and David Koch.

Raising the gas tax is like-

needs.

Opposition to the tax in-

open to raising the levy and last week unveiled a long-awaited plan to generate at least $1.5 trillion in new in-

vestment.

Trump surprised a bipar- up of House and ommittee leaders Feb. 14 White eeting by offering to support a 25-cent increase in the tax on gas and diesel fuel, according to Sen. Tom Carper of Dela-

sus Bureau, American Petroleum Institute and other sources to make their calculations. Their rankings for percent change were based on the state's current total gas levy, including state and federal taxes, compared with the total under the proposed hike.

Alaska, 81 percent; Oklahoma, 71 percent; Missouri, 70 percent; Mississippi, New Mexico and Arizona, 67 percent; Texas and Louisiana, 65 percent; and South Carolina and Alabama, 64 percent.

Those with the lowest state taxes would see the

Carbon pricing is a necessary part of a larger package of policies that can reduce greenhouse gas emissions.

- **Examples of complementary policies include:**
- **Performance standards:** Many countries set fuel **efficiency** standards for vehicles and energy efficiency standards for buildings, including for lighting, windows, ventilation and heating and cooling systems.
- **Fiscal instruments:** Some countries offer **tax exemptions or tax breaks** for appliances and energy efficiency improvements. Auto feebates, found in several European countries, combine a surcharge on energy inefficient cars with a rebate on more energy efficient vehicles.
- **Renewable portfolio standards:** Renewable portfolio standards, found in countries including Germany and Chile and in several U.S. states, require electricity providers to include a minimum share of clean energy in their output mix.
- **Trade policies: Cutting tariffs** on green goods such as solar panels, wind turbines, and energy-efficient light bulbs can help ensure access to the best technologies available globally.
- **Law enforcement:** In Brazil, **enforcing** and clarifying existing **laws** has proved to be an effective, low-cost strategy to reduce **deforestation**.

MISSING: CARBON NEGATIVITY SUBSIDIES!

https://www.carbonpricingleadership.org/what

INSTEAD

- INSTEAD OF FEE AND DIVIDEND
- MAKE IT FEE, WITH DIVIDEND AND FUNDS FOR CARBON NEGATIVITY

Citizens' Climate Lobby

NEWS; 2/20/2018: ADVOCATING/CARBON NEGATIVITIY

Posted on February 20, 2018 in CCL News

MISSING: NO FUNDING

ALSO MISSING: BETTER ALTERNATIVES: BIOCHAR

Study: Crushed rock added to soil can pull CO2 out of atmosphere to mitigate climate change

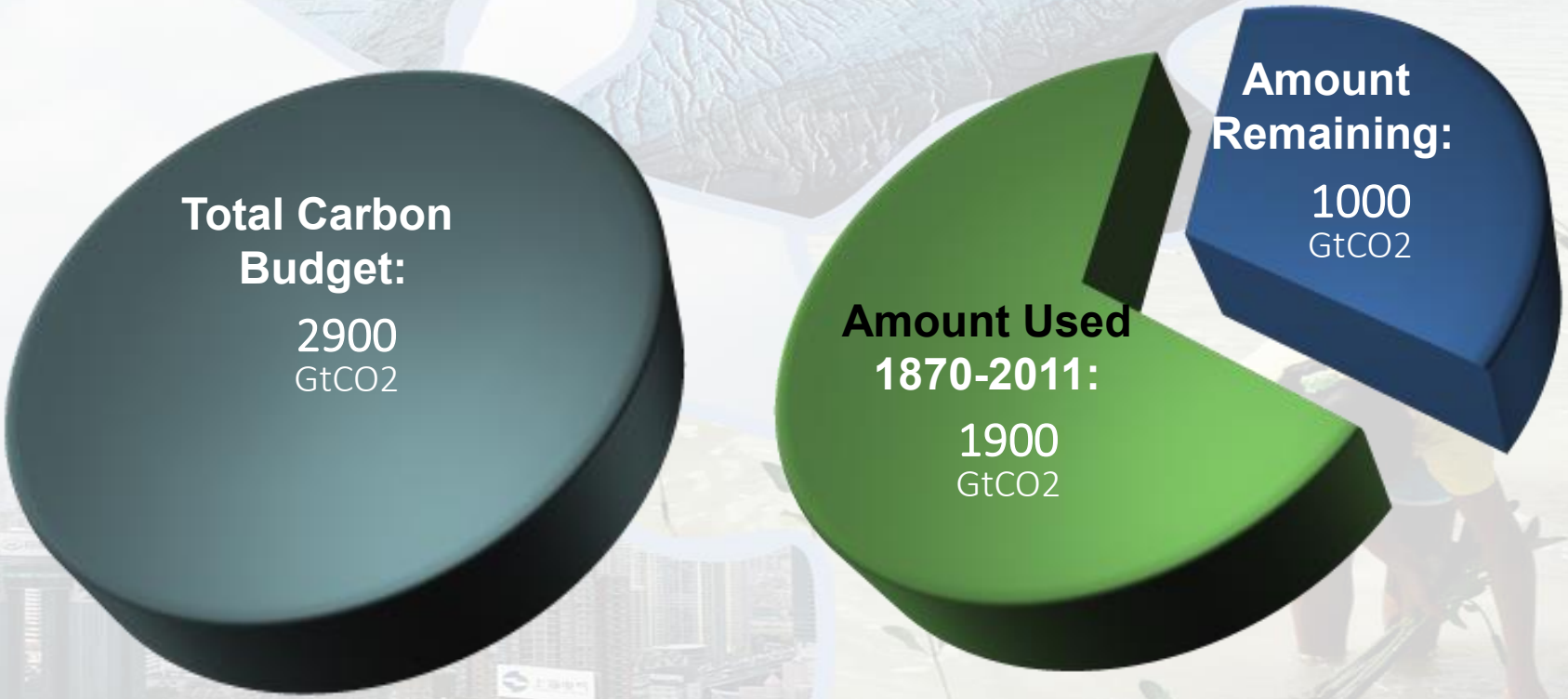
By Steve Valk

https://citizensclimatelobby.org/study-crushed-rock-added-soil-can-pull-co2-atmosphere-mitigate-climate-change/

If you are Wondering WHY

WHY: The window for action is rapidly closing

65% of our carbon budget compatible with a 2°C goal already used

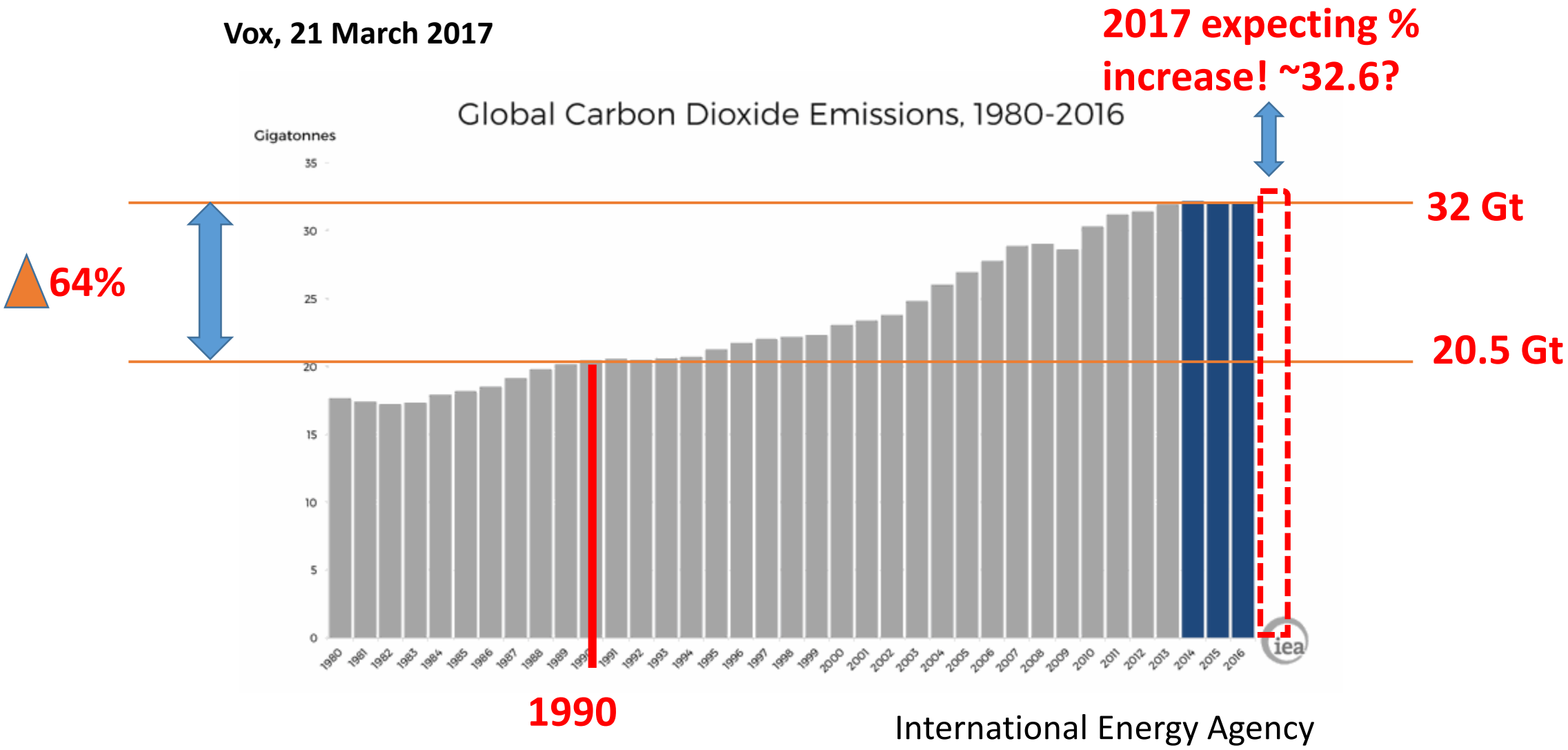


AR5 WGI SPM

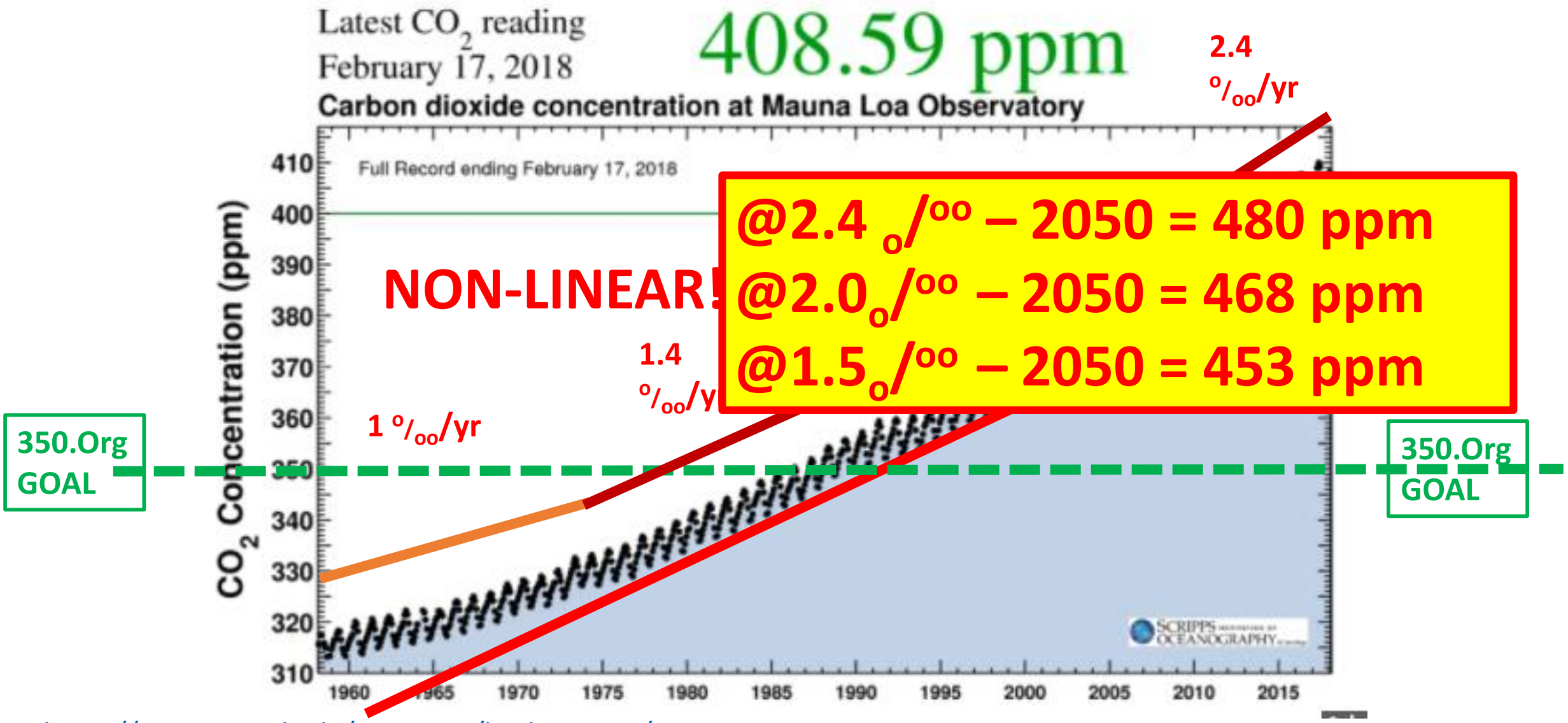
INTERGOVERNMENTAL PANEL ON climate change

Global Carbon Emissions

Vox, 21 March 2017



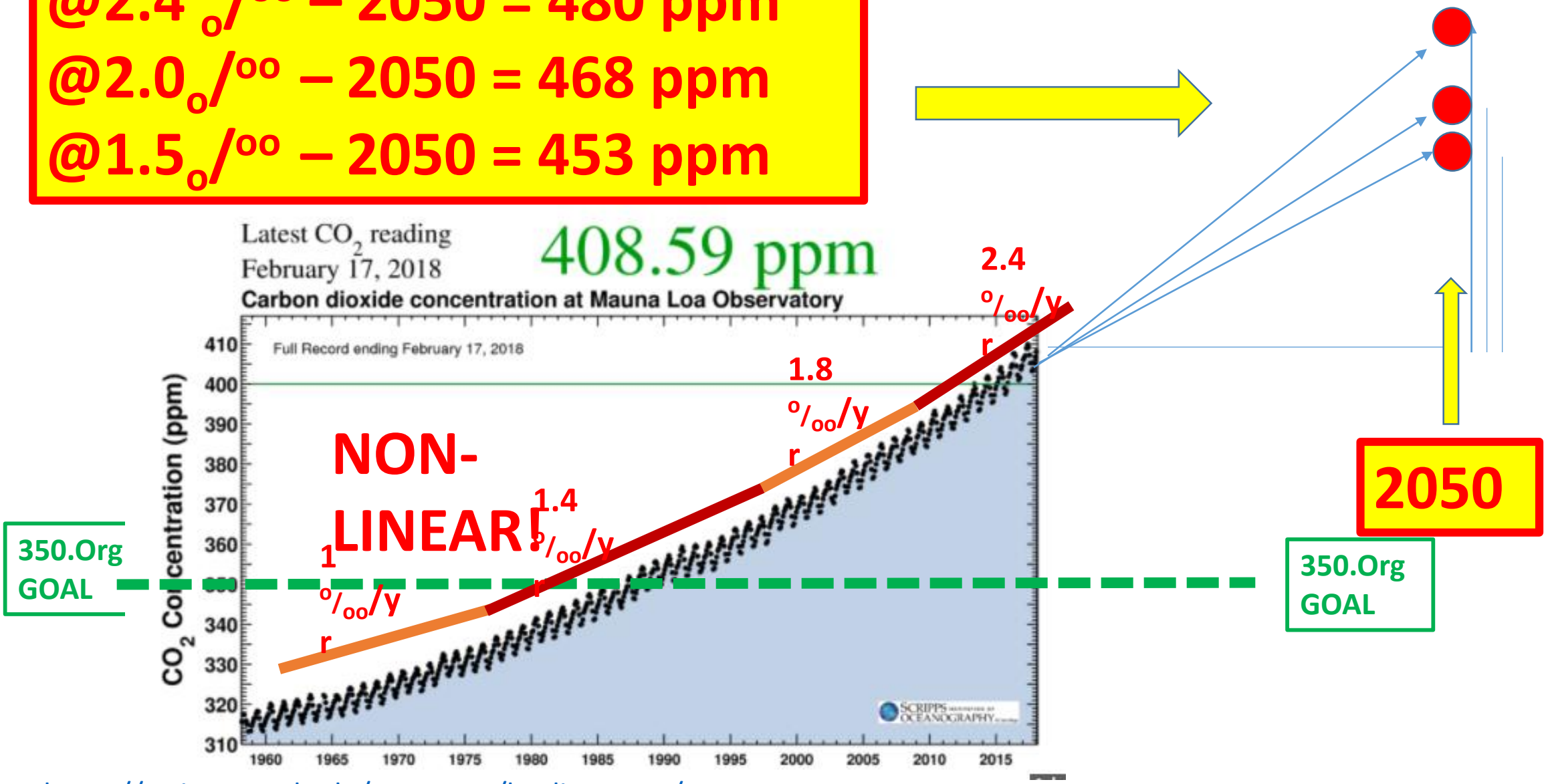
The Rate of CO_2 Rise Keeps Increasing!



https://scripps.ucsd.edu/programs/keelingcurve/

The Rate of CO_2 Rise Keeps Increasing!

@2.4 $_o/^{oo}$ – 2050 = 480 ppm
@2.0$_o/^{oo}$ – 2050 = 468 ppm
@1.5$_o/^{oo}$ – 2050 = 453 ppm



https://scripps.ucsd.edu/programs/keelingcurve/

CAN WE TRUST OUR POLITICIANS OR CORPORATE STATEMENTS FOR THAT MATTER??

IS IT MERELY LIP SERVICE: MOTHER JONES: “Concerns About Climate Caucus!”

“I started taking a very hard look, realizing not only were they not producing anything in the way of a bill beyond press releases. Their voting patterns were really no different from voting patterns of Republicans outside the caucus.”

https://www.motherjones.com/environment/2018/02/a-climate-caucus-has-turned-into-a-magnet-for-house-republicans-wait-what/

ACTION ITEMS: WHAT WE NEED TO DO

1. DE-Carbonize Energy:

YES – FEE AND DIVIDEND HELPS HERE

- Transportation
- Manufacturing

2. Carbon Dioxide Removal = Carbon Negativity

CLIMATE MITIGATION OPTIONS: The need for CO_2 Removal

GEOENGINEERING:

- ~~Solar Radiation Management (SRM) – NOT and Advocate (MANY ETHICAL ISSUES)~~
- Carbon Dioxide Removal (CDR) = Carbon Negativity
  - ~~Clean Coal – Not an Advocate – Cost and Ethics~~
  - ~~BECCS: SST without other benefits~~
  - BIOCHAR: Low Cost, Thermal Byproducts, Soil Enhancement and Sequestration

WHAT'S IN STORE IF WE DON'T HAVE CARBON NEGATIVITY ?

- Significant and rapid CO_2 increases and associated climate change leading to:
  - Economic losses
  - Social upheaval and
  - Migration of peoples across the world.
  - Ocean Acidification
  - Etc…..

  - **We must lead by example** – WHY?
  - Even though China now leads in Emissions U.S. DOES Historically
  - We need to get back into The Paris Accord!

WHY WAIT FOR A FEE TO BE IMPOSED?
WHAT YOU CAN ETHICALLY DO:

IMPOSE A FEE ON YOUR CARBON FOOTPRINT

- $0.33/GALLON Gasoline ~= $5/fillup
- $0.02/ kWh ~= avg 600 kWh = $12/month
- $7.00/trip Denver-Chicago-NY .71 metric tons
- $28.00/trip Denver-UK-Rome 2.73 metric tonnes
- $100/YEAR CH_4 HEATING
- A/C

BUY BIOCHAR WITH IT – CONTACT A LOCAL FARMER

https://calculator.carbonfootprint.com/calculator.aspx?tab=3

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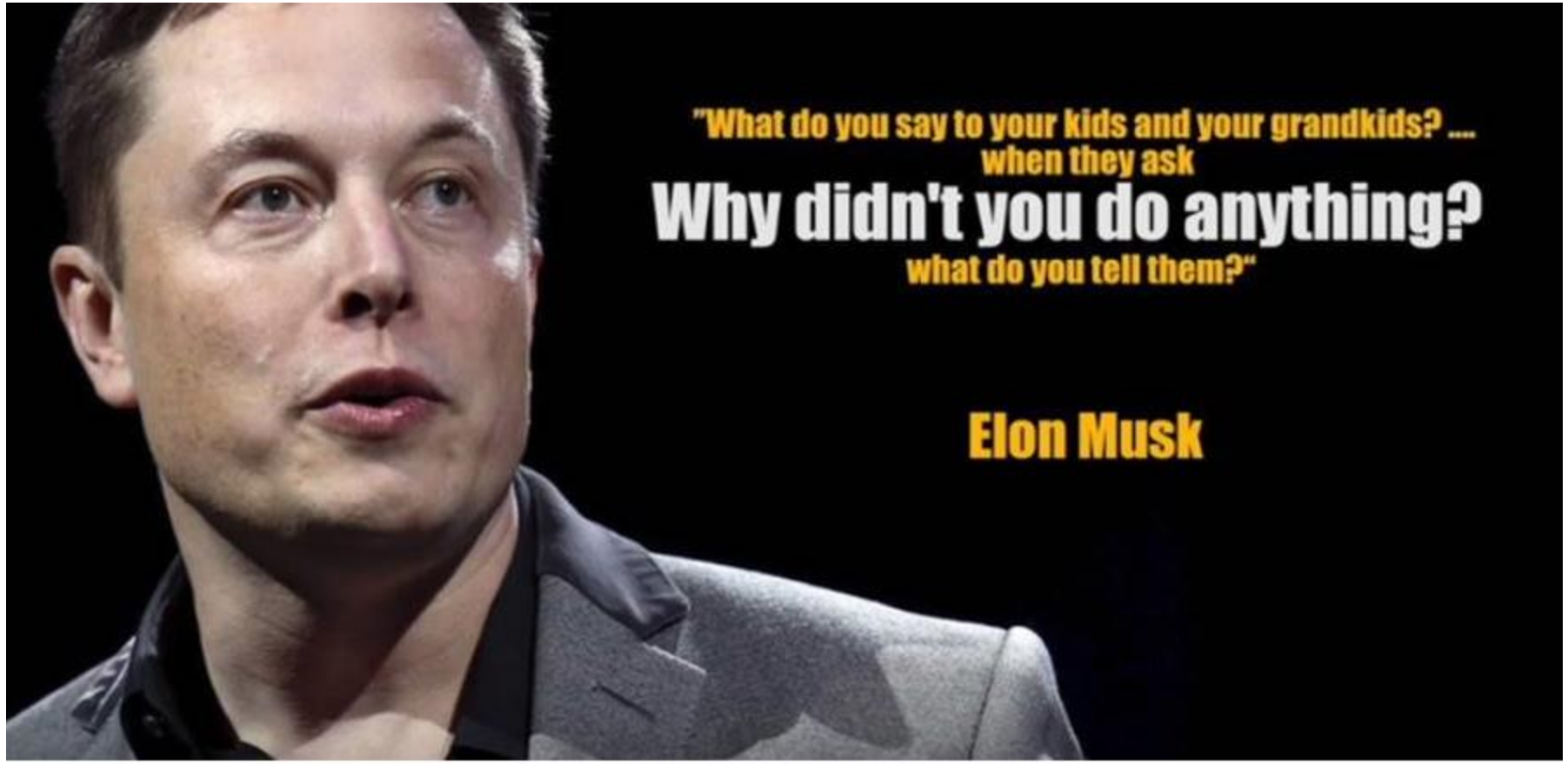
- $28.00/trip Denver-UK-Rome 2.73 metric tonnes
- $100/YEAR CH_4 HEATING
- A/C $??

Scenario #1; 15,000, 25 mpg – 40 fillups	Scenario #2 – GREENER; ICE car 20%
$200.00	$30.00
$72.00	$0.00
$21.00	$21.00
$25.00	$25.00
$100.00	$100
TOTAL=$418.00	TOTAL =$176.00

BUY BIOCHAR WITH ½$$ of IT? – CONTACT A LOCAL FARMER

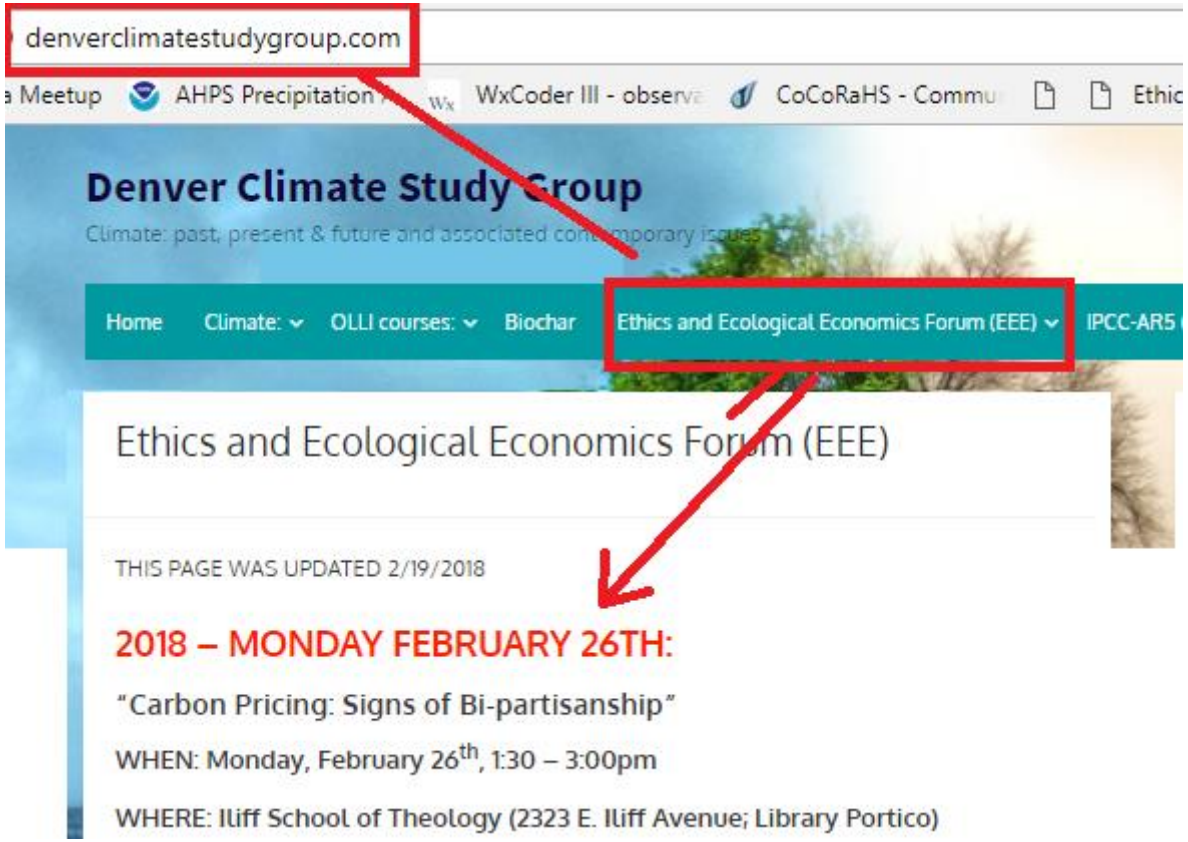
https://calculator.carbonfootprint.com/calculator.aspx?tab=3

I’m trying!


"What do you say to your kids and your grandkids? ....
when they ask
Why didn't you do anything?
what do you tell them?"
Elon Musk

What if?

Joel Pett


denverclimatestudygroup.com
Meetup
AHPS Precipitation
WxCoder III - observa
CoCoRaHS - Commu
Ethic
Denver Climate Study Group
Climate: past, present & future and associated contemporary issues
Home
Climate:
OLLI courses:
Biochar
Ethics and Ecological Economics Forum (EEE)
IPCC-AR5
Ethics and Ecological Economics Forum (EEE)
THIS PAGE WAS UPDATED 2/19/2018
2018 – MONDAY FEBRUARY 26TH:
"Carbon Pricing: Signs of Bi-partisanship"
WHEN: Monday, February 26th, 1:30 – 3:00pm
WHERE: Iliff School of Theology (2323 E. Iliff Avenue; Library Portico)

ANNOUCEMENT

https://www.cres-energy.org/

Thursday, March 1, 2018

Front Range Cities Ready for 100% Renewable Energy! (w. Sierra Club)

Hosted by Martin Voelker

From Colorado Renewable Energy Society – Jefferson County

https://www.meetup.com/J-CRES/events/247185618/

FOLLOWING BIOCHAR SLIDES DEFERRED TO NEXT MEETING – tentatively set for March 26th

Biochar Possibilities for Colorado

Ron Larson

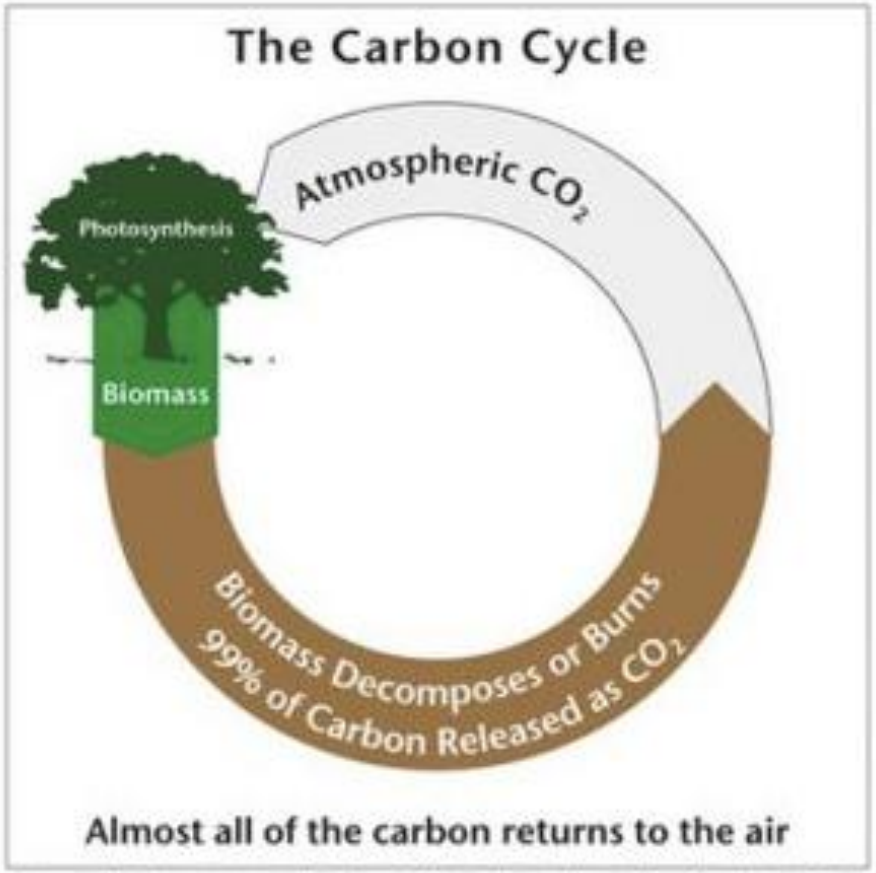
EEEF Meeting; 26 February, 2018

What is Biochar?

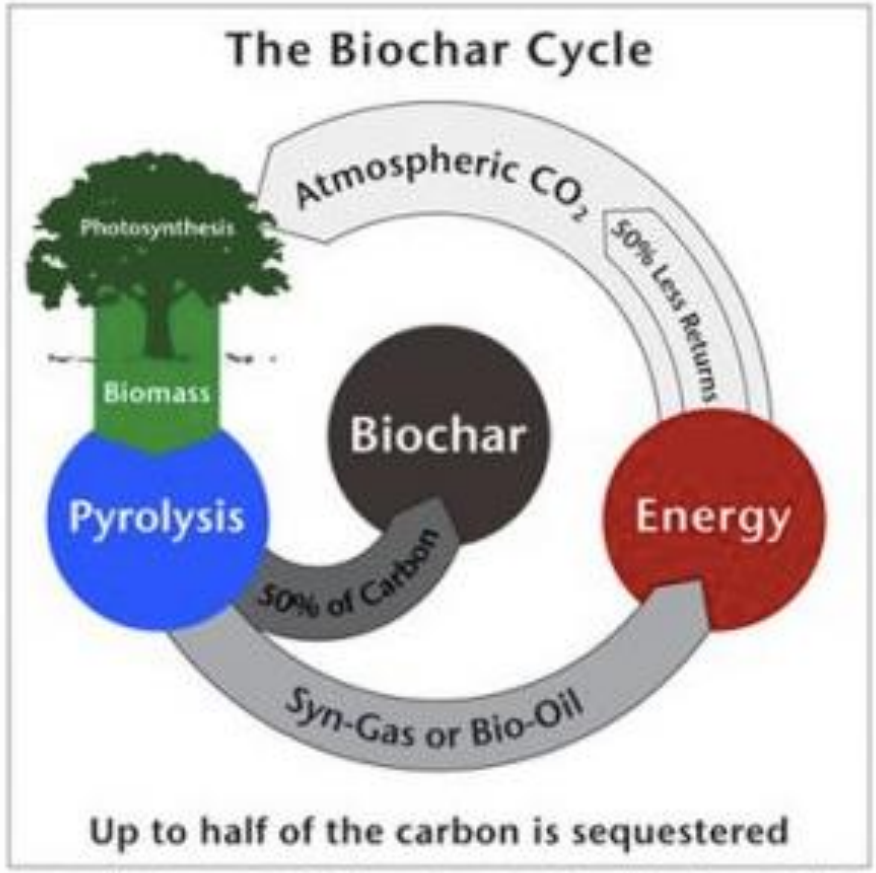
1. Main: Biochar is “ordinary” charcoal - after placement in the ground. (Not for combustion.)

2. Also - dozens of other [long-life] uses of charcoal (cattle feed, water quality, construction materials,……)

3. Terra Preta (1000’s of years, Amazon)



Green plants remove CO_2 from the atmophere via photosynthesis and convert it into biomass. Virtually all of that carbon is returned to the atmosphere when plants die and decay, or immediately if the biomass is burned as a renewable substitute for fossil fuels.



Green plants remove CO_2 from the atmophere via photosynthesis and convert it into biomass. Up to half of that carbon is removed and sequestered as biochar, while the other half is converted to renewable energy co-products before being returned to the atmosphere.

WHAT IS BIOCHAR?

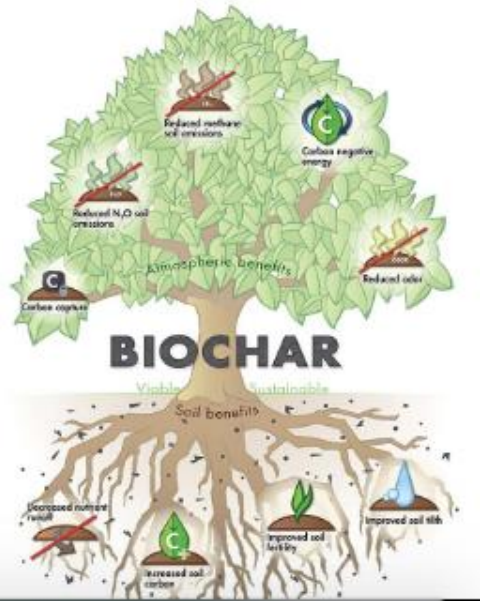
- Terms and Definitions
- FAQs
- Biochar and Soils
- Production Technology
- Climate Change and Biochar

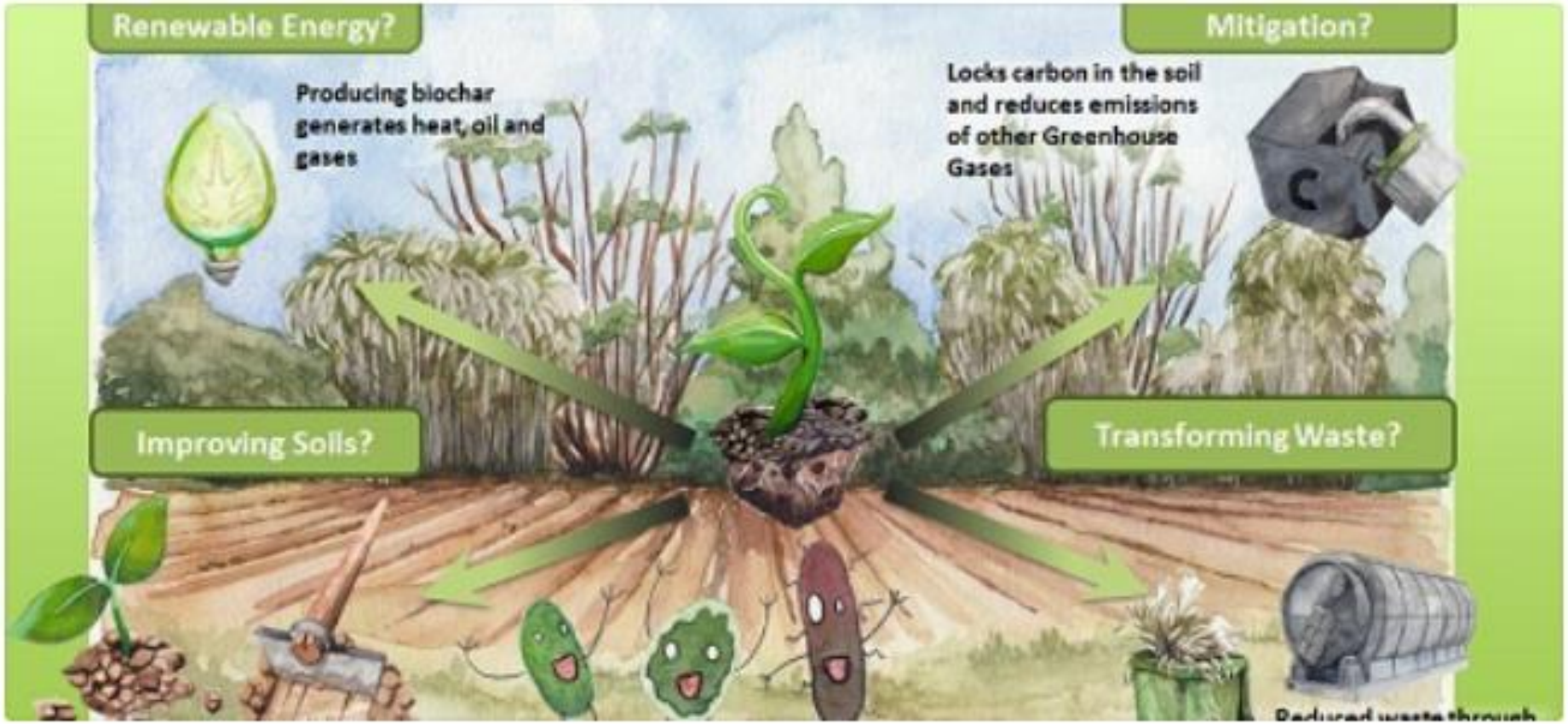
Biochar Is a Valuable Soil Amendment

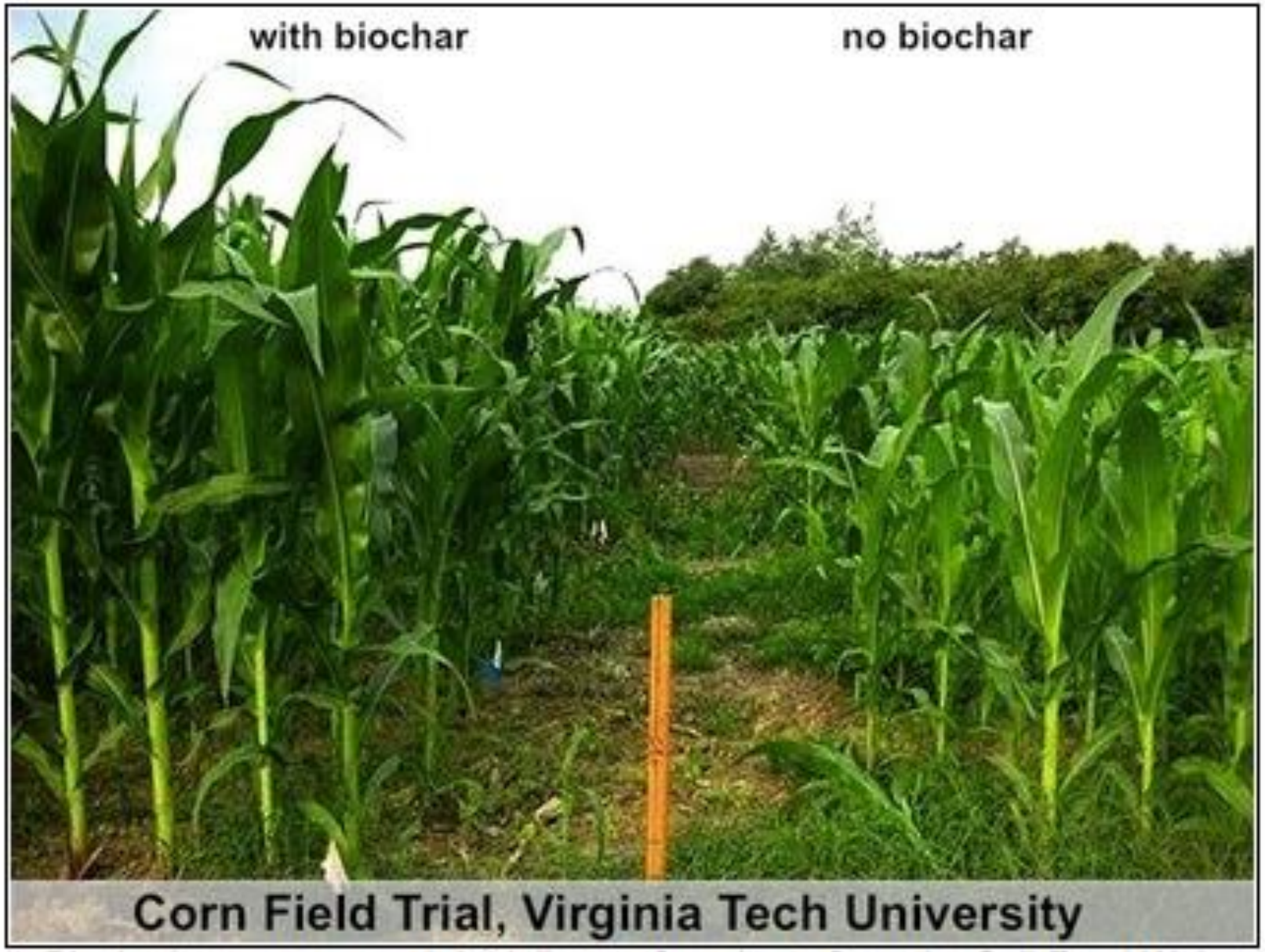
This 2,000 year-old practice converts agricultural waste into a soil enhancer that can hold carbon, boost food security, and increase soil biodiversity, and discourage deforestation. The process creates a fine-grained, highly porous charcoal that helps soils retain nutrients and water.

Biochar is found in soils around the world as a result of vegetation fires and historic soil management practices. Intensive study of biochar-rich dark earths in the Amazon (terra preta), has led to a wider appreciation of biochar's unique properties as a soil enhancer.

Biochar can be an important tool to increase food security and cropland diversity in areas with severely depleted soils, scarce organic resources, and inadequate water and chemical fertilizer supplies.




Renewable Energy?
Producing biochar generates heat, oil and gases
Mitigation?
Locks carbon in the soil and reduces emissions of other Greenhouse Gases
C
Improving Soils?
Transforming Waste?

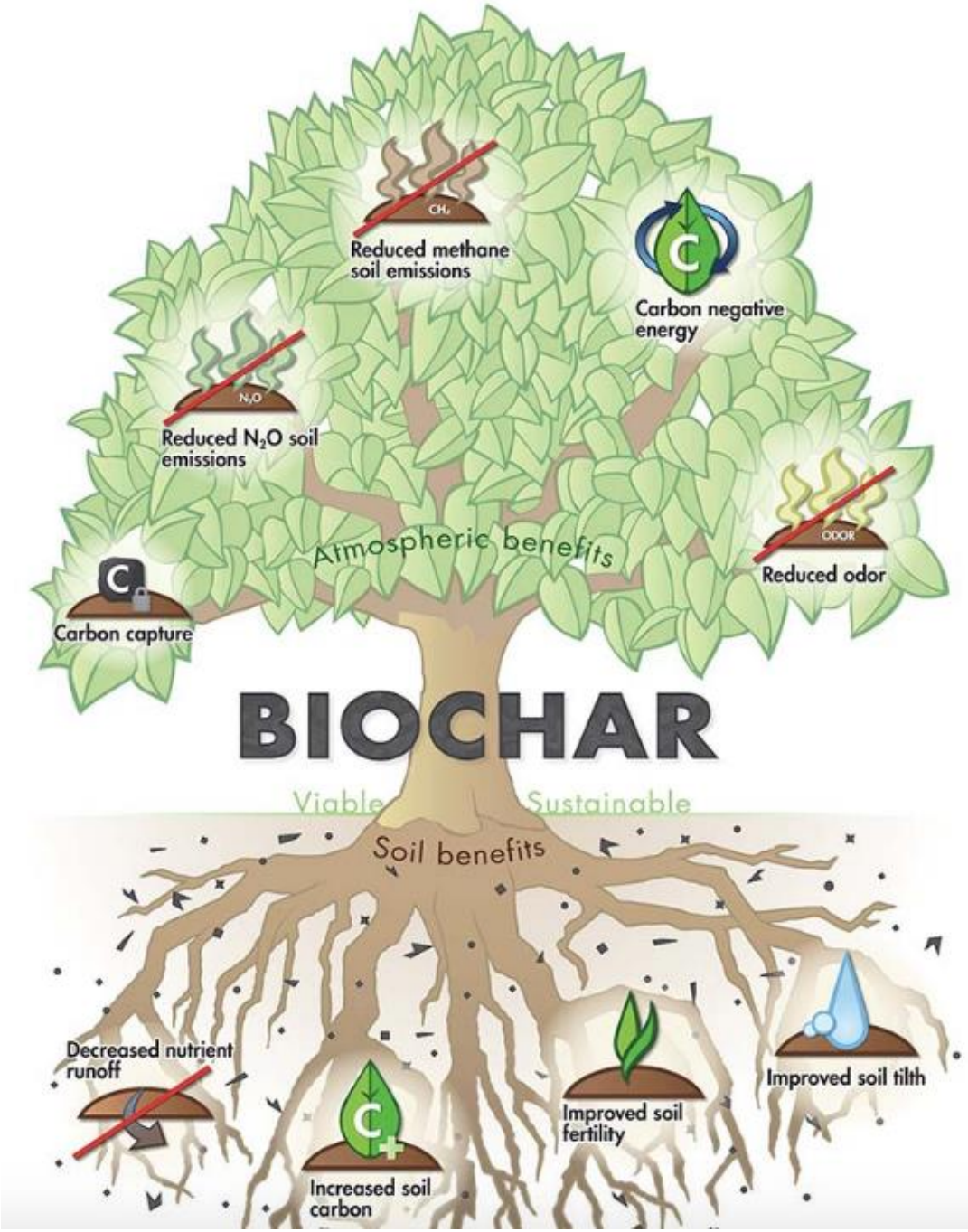


Biochar's greater growth is delivery of nutrients from the Soil Food Web

Why Important ?

a. Soil & Food (long life in soil, not an expense)
b. Carbon negativity (CO2, CH4, N2O)
c. Energy (solar & woodstove backup, stored energy)
d. Water quantity/quality
e. Waste disposal (biogas competitor)
f. Lowered fertilizer, irrigation costs
g. Jobs, rural income (and land value)
h. Forest health (Fires)
i. Ocean and HTC potential
j. Other (including sustainability)


h. Forest fires
f. Fertilizers, irrigation
e. Waste
i. Ocean; HTC
a. Soil, food; (also #12)
g. Jobs, income; (also #10, #11, #12)
d. Water
c. Energy; (also #9, #12)
j. Other
b. Climate action
g. Jobs
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH & WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER & SANITATION
7 AFFORDABLE & CLEAN ENERGY
8 DECENT WORK & ECONOMIC GROWTH
9 INDUSTRY INNOVATION & INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITY & COMMUNITIES
12 SUSTAINABLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE & JUSTICE
17 PARTNERSHIP FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS


Reduced methane soil emissions
Carbon negative energy
Reduced N_2O soil emissions
Atmospheric benefits
Reduced odor
Carbon capture
BIOCHAR
Viable
Sustainable
Soil benefits
Decreased nutrient runoff
Improved soil tilth
Improved soil fertility
Increased soil carbon


Volume
Value
Readiness
Building Materials
Livestock Feed
Volume
Value
Readiness
Packaging Materials
Volume
Value
Readiness
Filtration
Volume
Value
Readiness
3D Printing
Volume
Value
Readiness
Remediation
Volume
Value
Readiness
Fuel Cell
Volume
Value
Readiness
Gardeners
Volume
Value
Readiness
Carbon Offsets
Volume ? ? ? ? ?
Value
Readiness
Agriculture
Volume
Value
Readiness
Low
Low/Medium
Medium
Medium/High
High or Immediate
Biochar
Markets

HORTICULTURE

Biochar's long-term benefits to soil proven

12th May 2017 7:00 AM

CARBON COPY: The Wollongbar site simulating an intensive dairy pasture used to test biochar's long-term effects upon the soil.

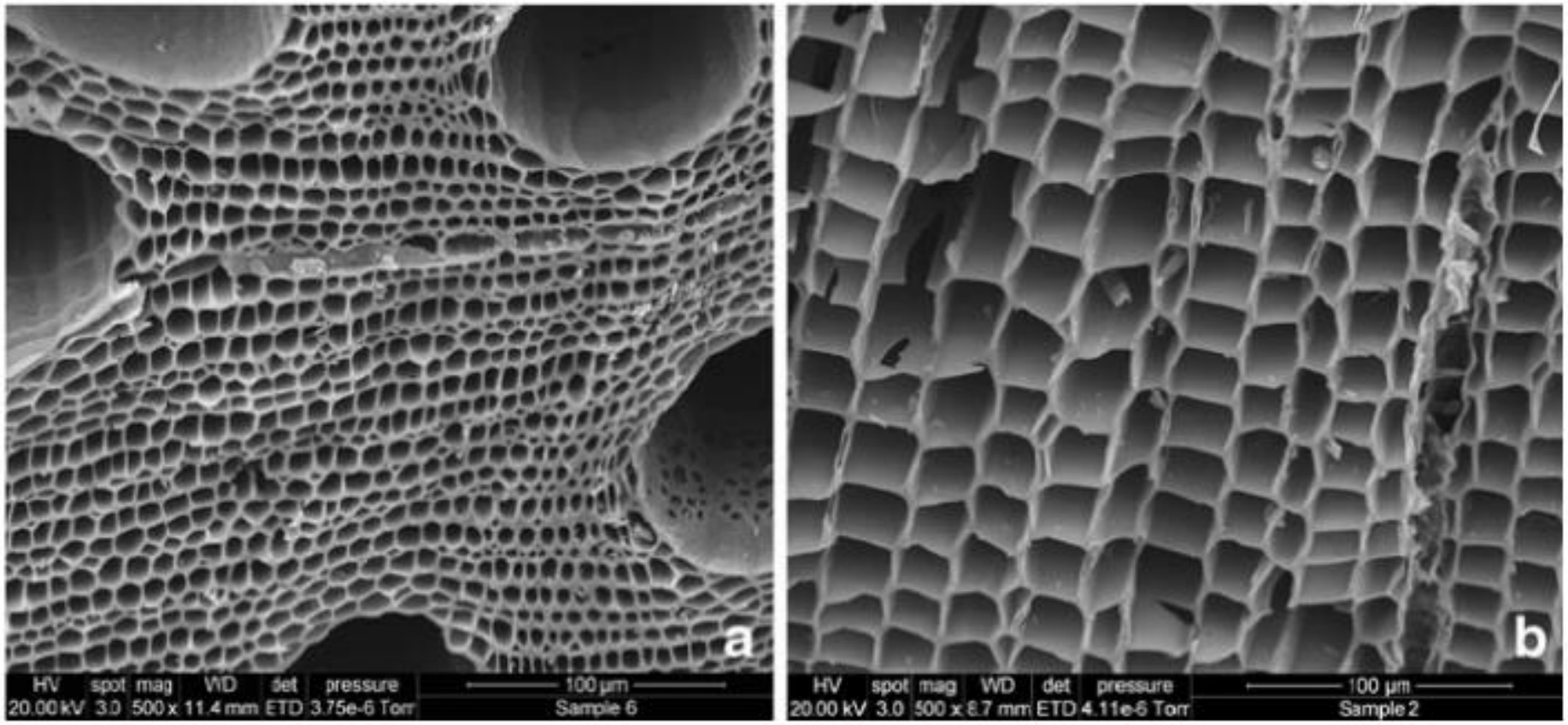
How to Make??

Found under “Pyrolysis, Gasification, Carbonization, HTC, Synthesis gas”

1. Stoves (“TLUDs”; metal, ceramic, cleaner, more efficient, 25% char by weight)
2. “World Stove” (down-flow hot nitrogen)
3. “Kon Tiki” (cones, pits “flame caps”)
4. Oil barrels (air separation, control)
5. Convert wood boilers (speed avoids ash)
6. With biofuels (petrol, etc. - Cool Planet)
7. Above, after pelletizing crop residues

CDR Competitors ? (All expenses - not investments; <u>NOT</u> the SRM part of Geoengineering: "Geo")

1. BECCS (Biomass Energy with Carbon Capture and Sequestration ["Clean Coal"] liquid, high pressure, deep underground)
2. DAC (Direct Air Capture of 400 ppm CO2)
3. Convert rocks to carbonates
4. Ocean chemistry (bicarbonates)
5. Ocean biomass
6. Land management (afforestation, cattle, no till, etc.)


a
HV spot mag WD det pressure
20.00 kV 3.0 500 x 11.4 mm ETD 3.75e-6 Torr
100 µm
Sample 6
b
HV spot mag WD det pressure
20.00 kV 3.0 500 x 8.7 mm ETD 4.11e-6 Torr
100 µm
Sample 2


www.permaculture.co.uk

FAVORITE BIOCHAR WEB RESOURCES

Once or more per day: biochar@yahoogroups.com

CarbonDioxideRemoval@googlegroups.com

info2@carbonbrief.org

stoves@lists.bioenergylists.org

2. **Once or more per week:** www.biochar-international.org

www.biochar-journal.org/en/

Biochar in Colorado - background

NREL - Golden has large biomass staff (+ pyrolysis)

CU-B hosted the first US Biochar Conference (2009)
CSU has knowledgeable staff (soils, pyrolysis)

Producers - three major biochar
(Cool Planet, Confluence energy, Biochar Now)

USFS - largest(?) contract (CSU - NREL- BANR)
(Biofuels from beetle kill - some biochar)

Legislation - first state re biochar (SJR - 17 - 002)
(Forests, fire fighting, beetle kill - Unanimous)

New Biochar for Colorado - Option #1

A cost-effective municipal system

(combined heat & power, waste management, biochar for use and sale, reduced irrigation, fertiliz.)

Proven success in Stockholm, Sweden

(US expertise is good - IBI webinar)

Would be the first in US

(Good PR for state - which is already on record))

Many cities probably ready

(Boulder, Denver, Ft. Collins, Lakewood, Pueblo)

Biochar for Colorado - Option #2a

State Incentive - (possibly popular) for CDR = NET
new, might be called "NET-FIT"

NET = Negative Emission Technology
applicable for about 6 different approaches
biochar likely to be cheapest
same as CDR = Carbon Dioxide Removal
or GGR = Greenhouse Gas Removal
FIT = Feed-In Tariff
Main past incentive in Germany
Subsidy - not a tax / fee; not a dividend
Need not be national
Funds from end-users of all forms of energy

Biochar for Colorado - Option #2b, cont'd

Private, not Governmental investment

Payments - investors respond to fixed price

- Units = tonnes C, possibly $30-$50/t C to start
  - value can change any time, per perceived need.
  - can start immediately and small

Some Detail - payment to Investors mostly as

- annual, fixed term, tax credits
- biochar unusual in having out-year benefits
- not regressive
- nothing forced, entirely optional