

Green Carbon



**Building Pathways to Sustainable
Green House Gas Reduction**

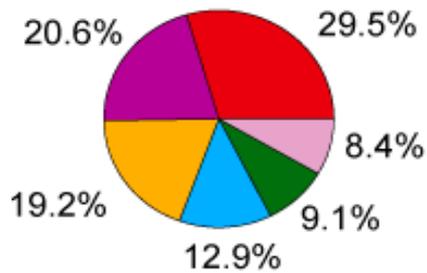
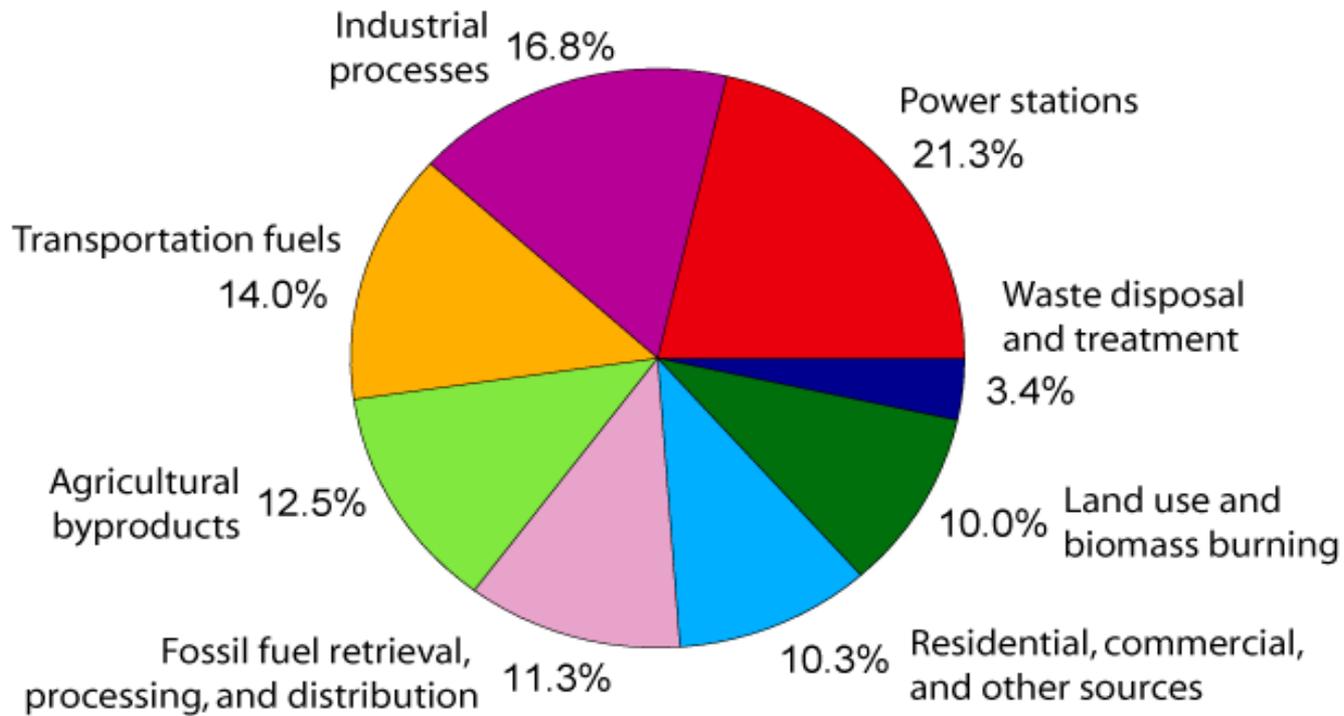
GREEN CARBON INC.

**The Future of Converting Scrap Tire to
Renewable Green Energy**

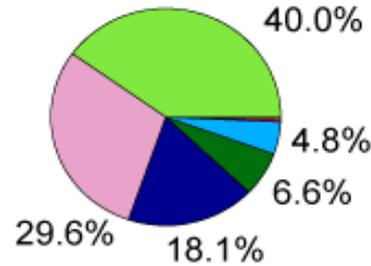


GHG

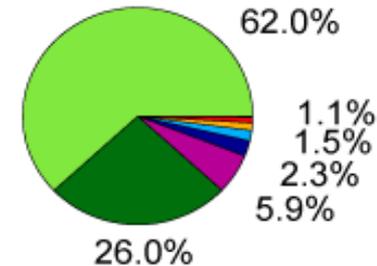
Annual Greenhouse Gas Emissions by Sector



Carbon Dioxide
(72% of total)



Methane
(18% of total)



Nitrous Oxide
(9% of total)

Today's Tire Recycling

Today's Tire Recycling

1. Designed to process a waste product into a fuel – coal fired power plants, cement plants, and paper mills.
2. Processed into crumb for various products – play grounds, sports fields, filler products for bumpers, matting, and various other items.
3. Millions of tires are still land filled, discarded in remote fields on private or public land.
4. All processes consume more energy than they replace
5. Climate change – Pollution and Green House Gases demand environmental beneficial processes to reduce Green House Gases.
6. The T.V.R. Process is a disrupter system designed to change the industry – Reduce Green House Gases.
7. Rethink how to recycle rubber products, tires, belting, and rubber tracks.



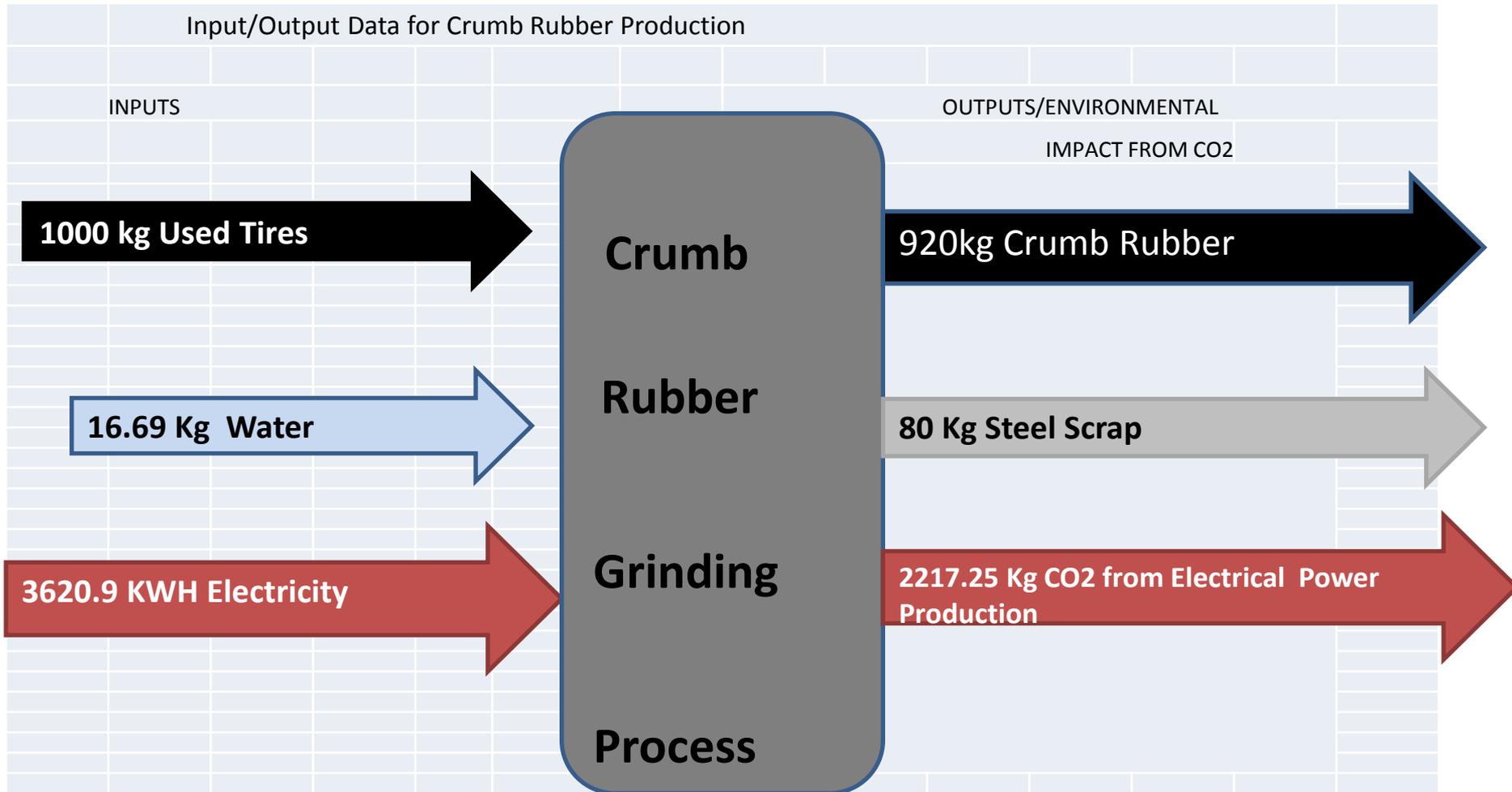
Green Carbon Accomplishments

- ❑ **US Patent** - Jan 8, 2013
- ❑ **South African Patent** - April 4, 2014
- ❑ **Canada Patent** - July 8, 2013
- ❑ **Europe Patent** - Nov 15, 2013

- ❑ **TSCA Consent & Approval**
 - ❑ **Light Oil** # P-12-0557 – Aug, 6, 2013
 - ❑ **Heavy Oil** # P-12-0558 – Aug, 6, 2013
 - ❑ **Carbon Black** # S-13-0006 – Sep, 26, 2013
- ❑ **EPA RSF2 Application**
- ❑ **Screening LCA EarthShift**
- ❑ **Full LCA with Critical Peer Review** – Jan 19, 2015



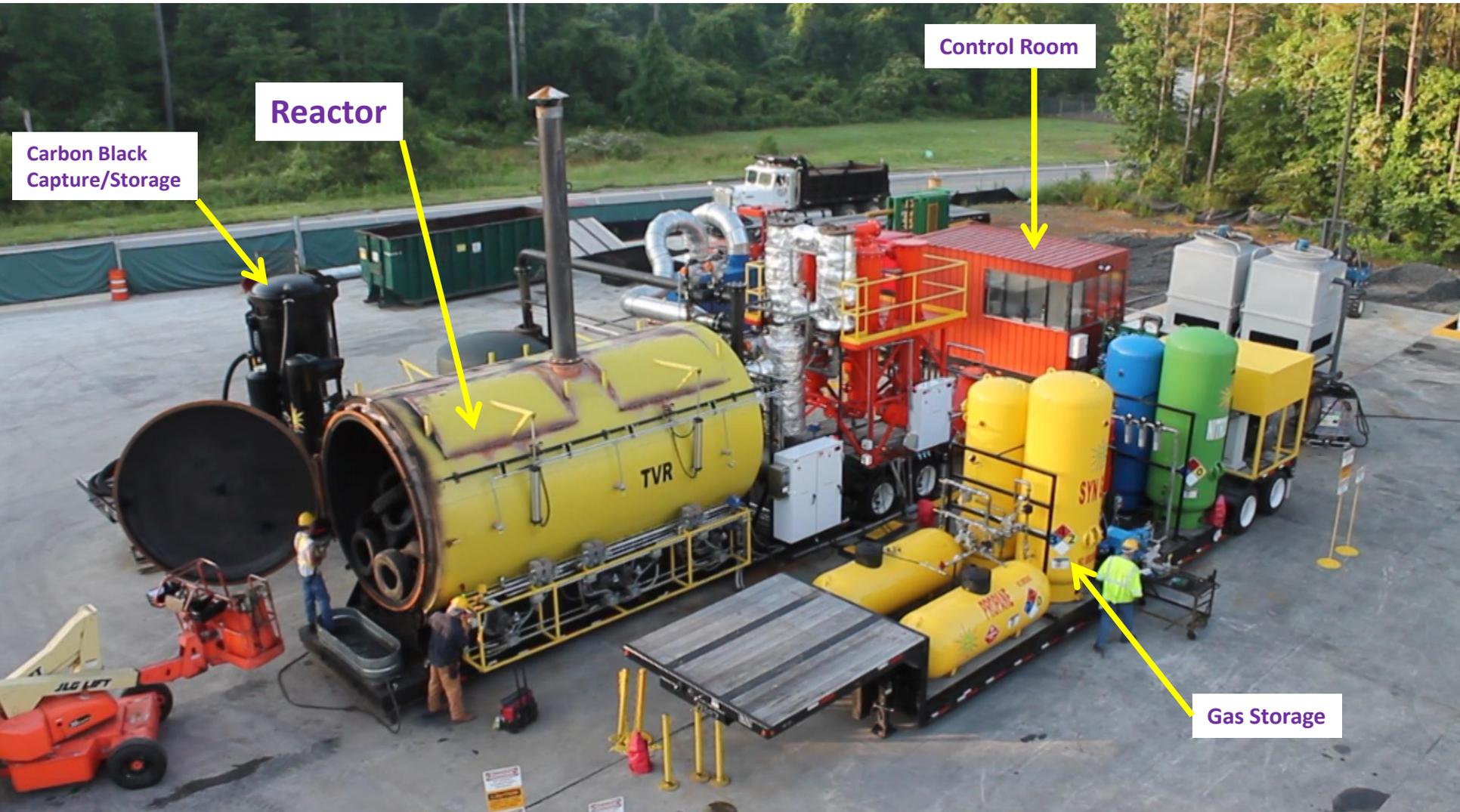
Data for Crumb Rubber Production



Reference
Ohio State University
Comparative life cycle analysis of alternative scrap tire applications.
April 15 2009



Portable Green Carbon TVR System



Reactor

Carbon Black
Capture/Storage

Control Room

Gas Storage



Green Carbon Solutions

Traditional approaches to recycle or process tires has not been effective in processing:

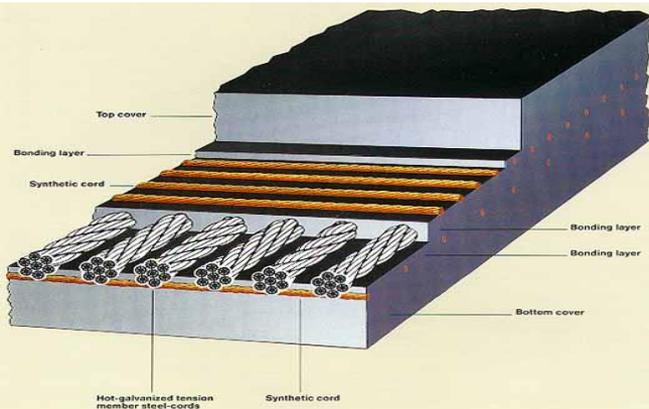
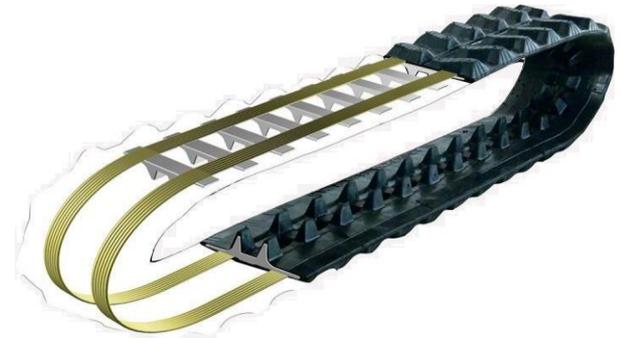


Rubber Tracks

- ❑ Can't Chip
- ❑ Burning not effective
- ❑ Land Filling

&

Conveyor Belts





Green Carbon



Bridgestone 59/80 R63

- ❑ Tire Weight 9,802 Lbs.

Suncor 63" Mining Tire Generates

- ❑ 588 Gallons Renewable Fuel Oil
- ❑ 3,136 Lbs Carbon Black
- ❑ 1,470 Lbs Steel
- ❑ 3,267 cu ft Reclaim Gas





TVR System Processing Tracks



Rubber Tracks in TVR Reactor

- ❑ 13,500 Lbs Used Tracks

Rubber Tracks After Processing

- ❑ 7,620 Lbs Carbon Steel
- ❑ 257 Gallons Fuel Oil
- ❑ 3,136 Lbs Carbon Black





Green Carbon Products

Renewable Blendstock



Carbon Black



Steel Wire

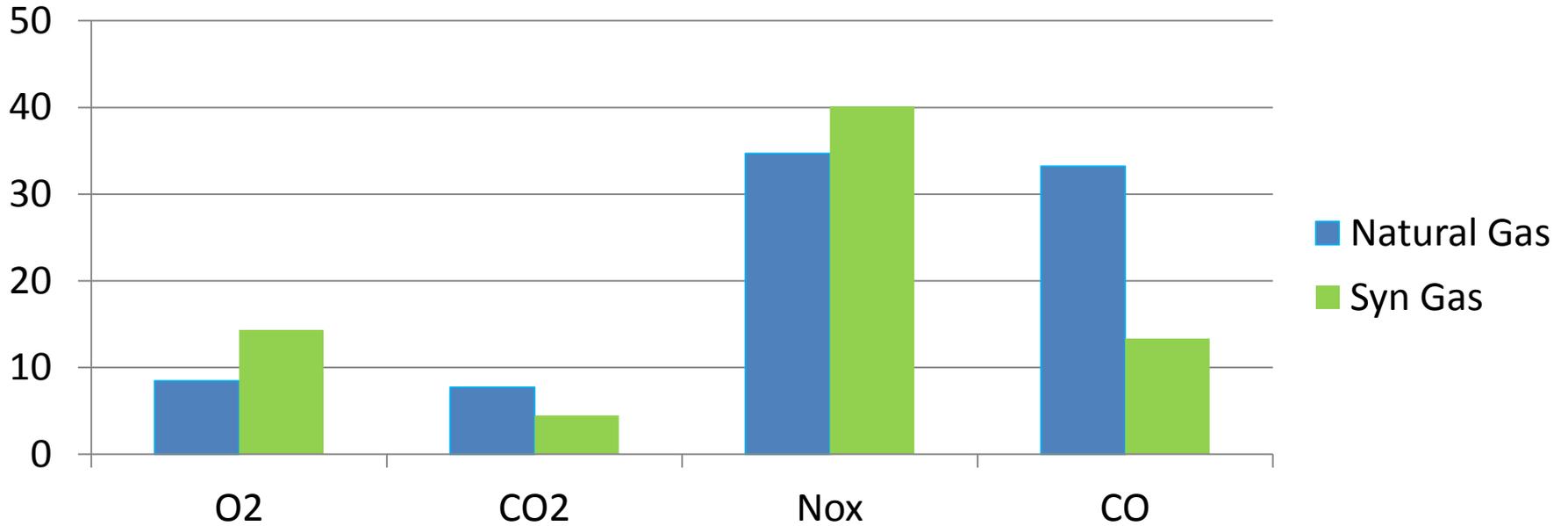


Reclaimed Gas





Air Emissions Results



**Comparing Natural Gas
Vs
Syn Gas from TVR unit**

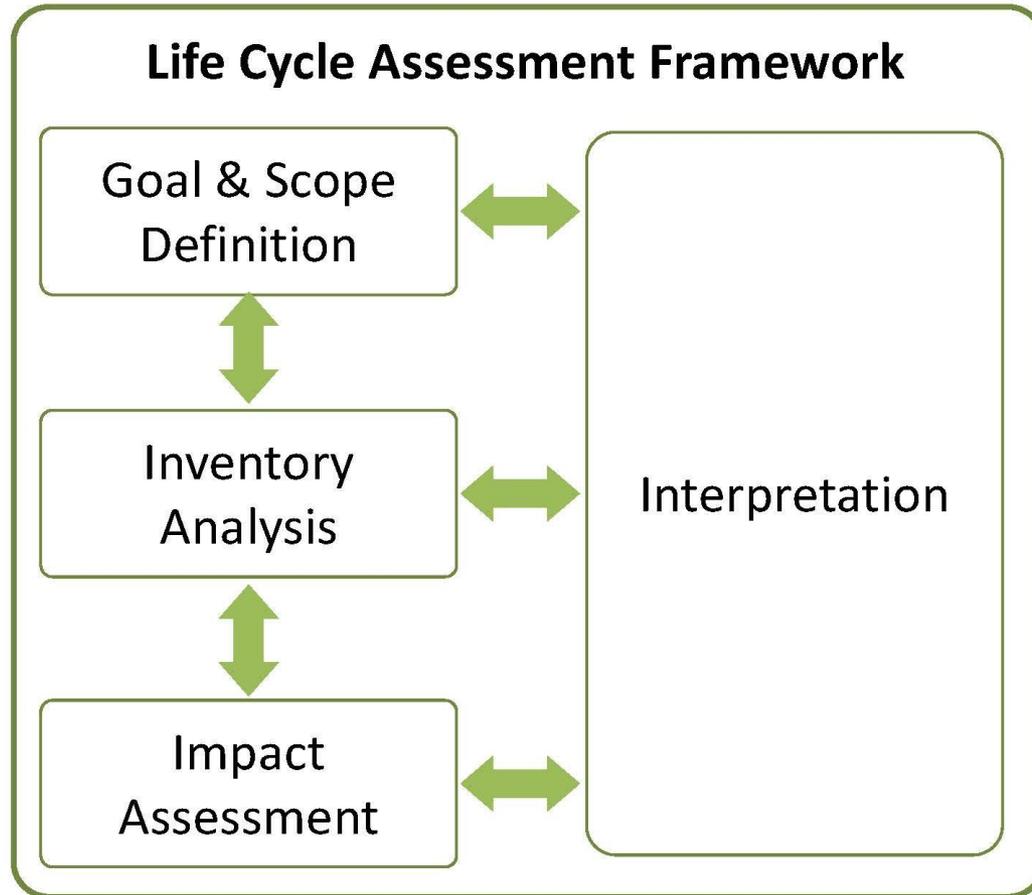


LCA Guidelines ISO 14040 - 14044

**INTERNATIONAL
STANDARDS**

**ISO
14044**

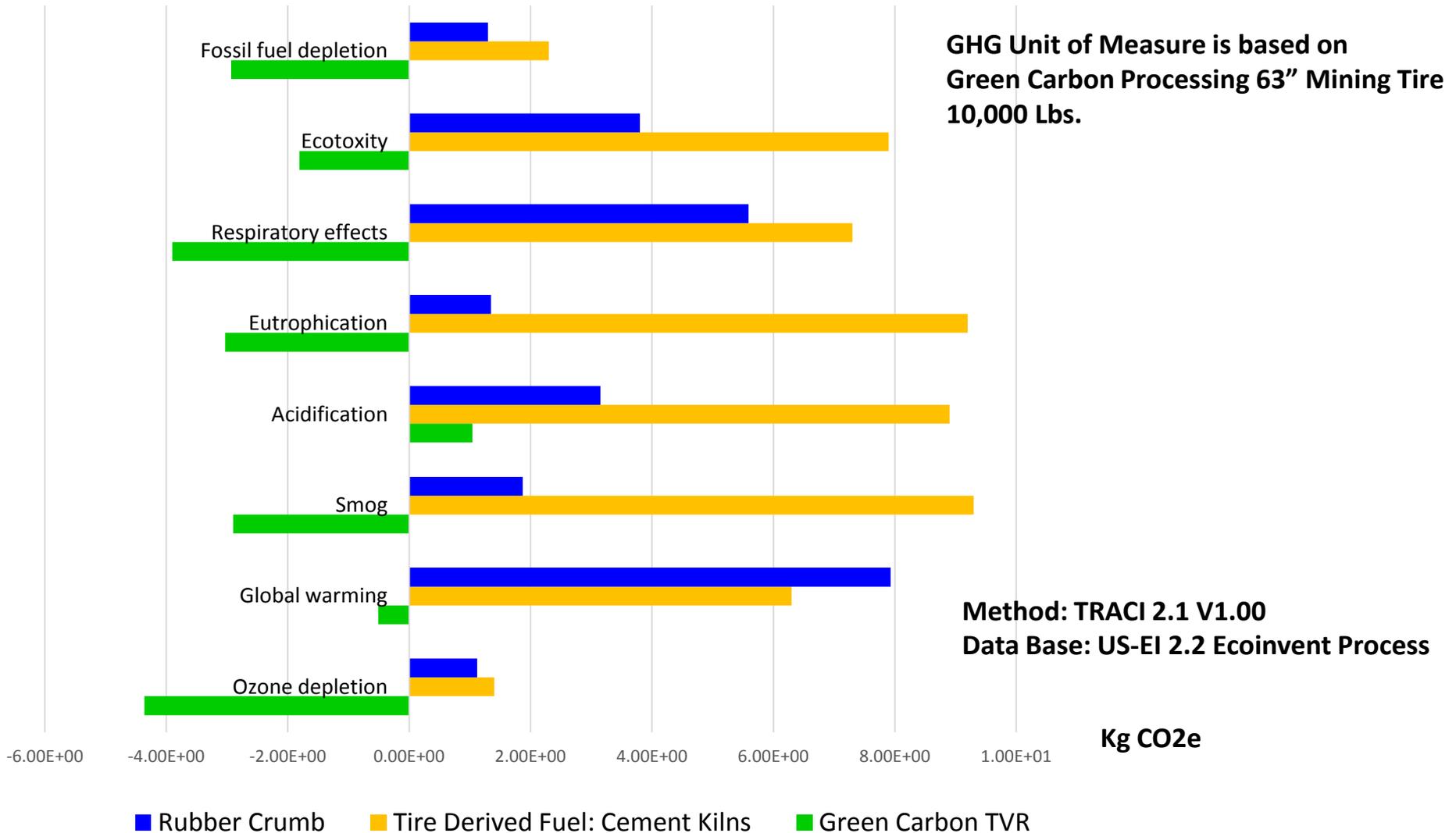
**Environmental Management – Life Cycle
Assessment – Requirements and Guidelines**





TVR System vs Alternative Methods

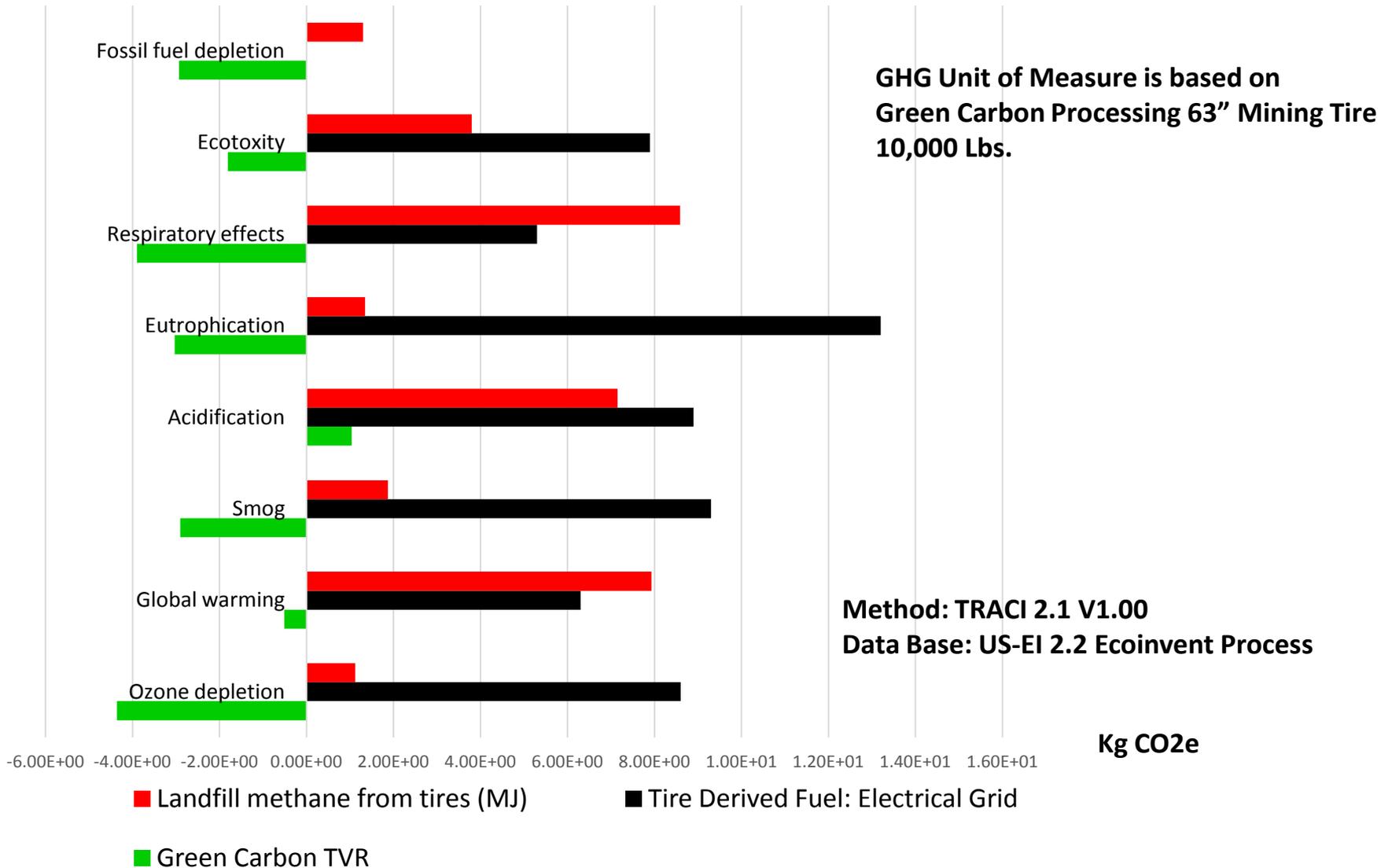
Comparing Green Carbons GHG Outputs with Alternative Process





TVR System vs Alternative Methods

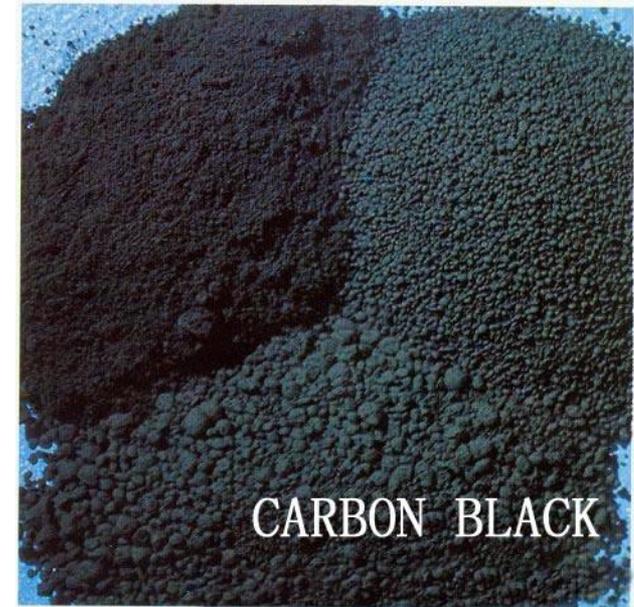
Comparing Green Carbons GHG Outputs with Alternative Process





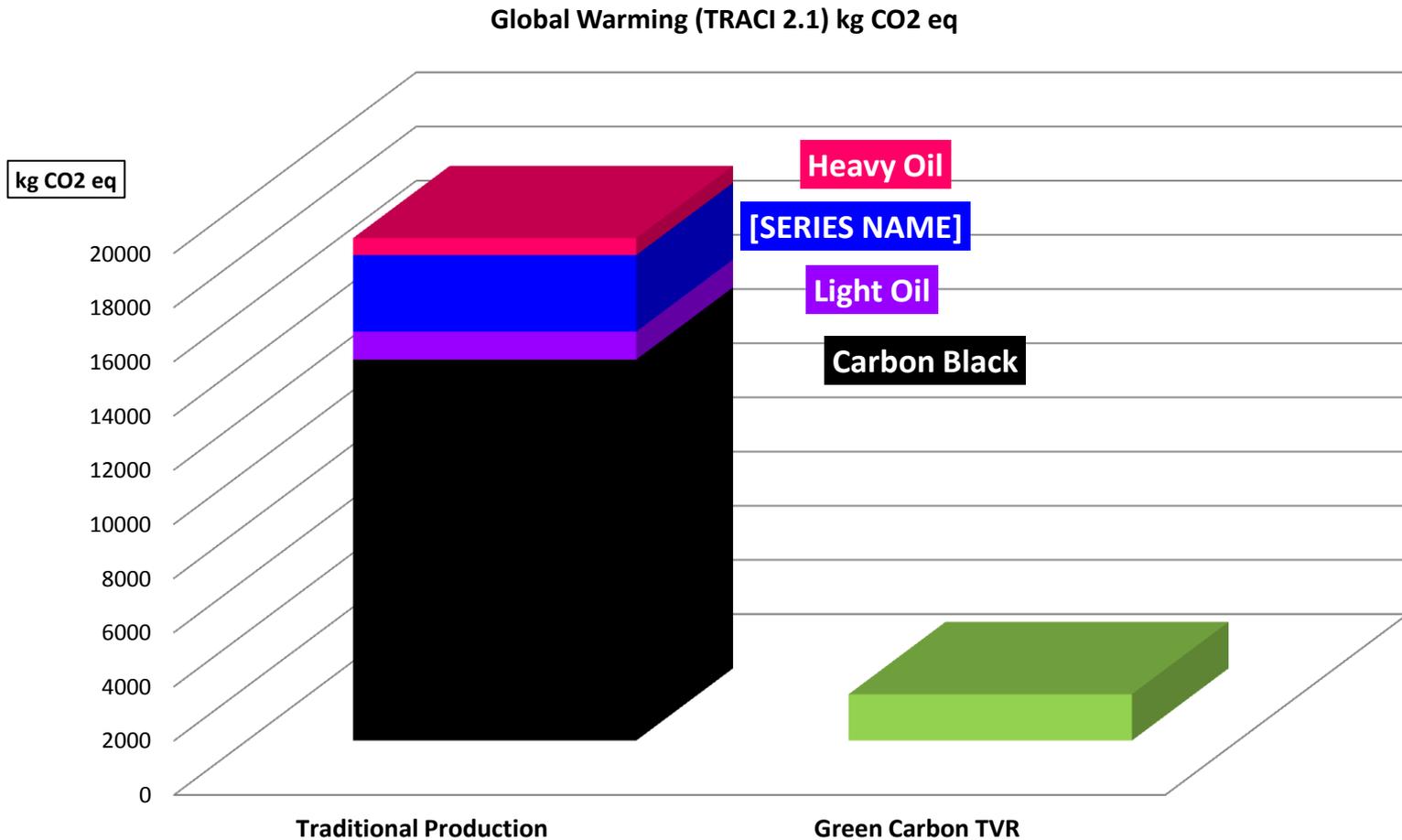
Carbon Black

- New tire ~ 30% Carbon black by weight.
- - Very large GHG contributor





GHG Benefits Green Carbon Process





Green Carbon Lab Refinery

During Distillation the renewable fuel feedstock is cut into multiple “fractions”, by heating the sample.

(ex:gasoline, diesel, kerosene, heavy oil)

The vapor travels up the “column” and condenses at the top where each “fraction” falls to a different container at the side of the unit.

Gasoline



22%

Kerosene /
Light Diesel



35%

Diesel



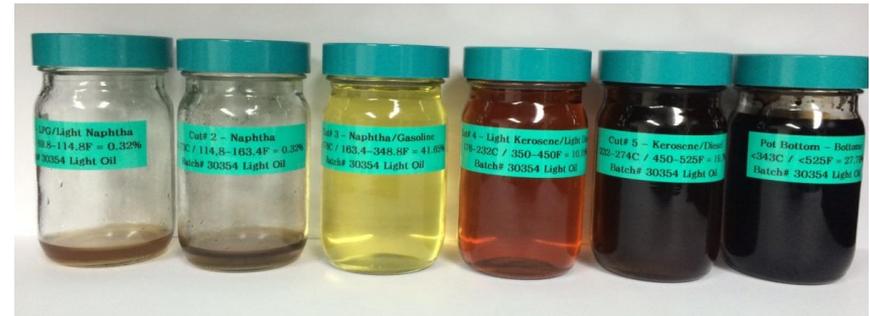
31%

Heavy
Gas Oil



10%

Distillation testing allows the laboratory to determine the volume of each grade of fuel is present in the sample.



Fuel feedstock is placed in a reservoir at the base of the unit and heated



Natural Rubber

New tire ~ 25/30% Natural Rubber

- Imported from Brazil, Indonesia, SE Asia





BETA Results – Mining Tire 63”



ISO-17025 Accredited Testing Laboratory

RJLA ISO/IEC 17025:2005 Testing Accreditation# 69423

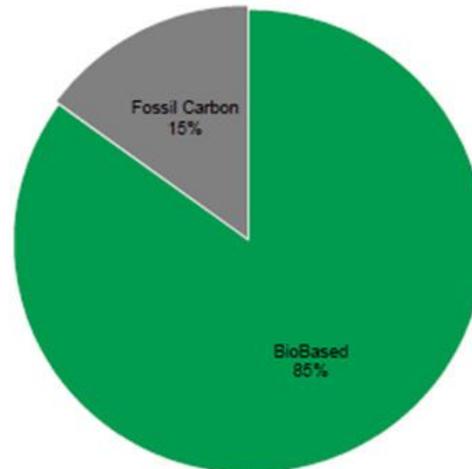
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Report of Biobased Content Analysis using ASTM-D6866-12

Submitter: Green Carbon Inc.
Submitter Label: Micheline 63” Light Fuel Feedstock
Laboratory Number: Beta-364022
Material: Biobased Material
Date Received: November 06, 2013
Date Reported: November 12, 2013

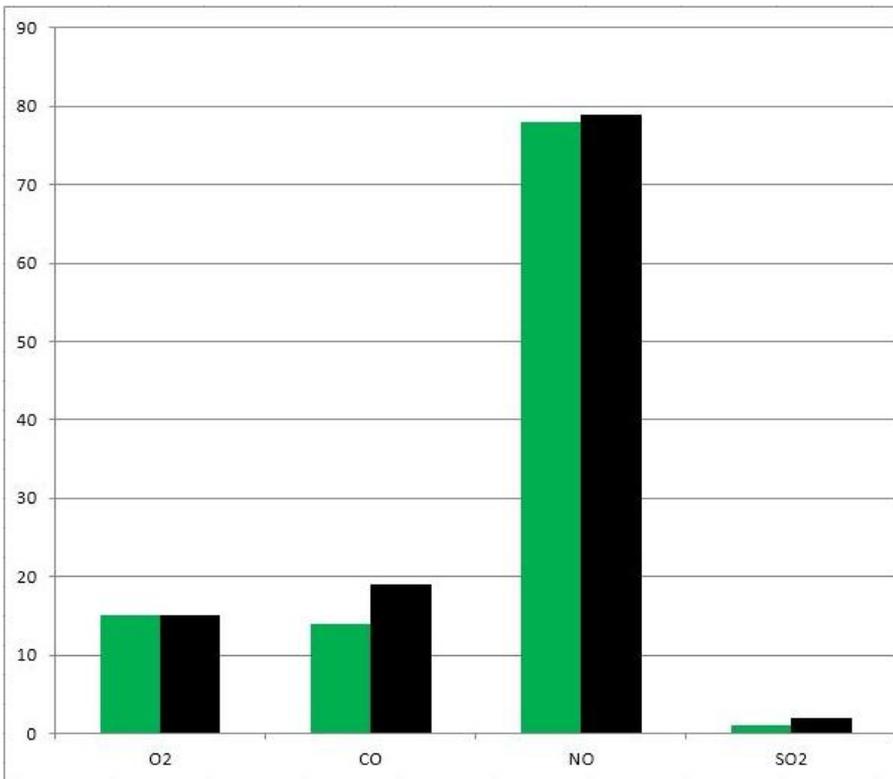
Mean Biobased Result : 85 % *

Proportions Biobased vs. Fossil Based indicated by
14C content





Furnace Running On TVR Oil



- Furnace 100% GC Light
- Furnace 100% Diesel

- Patriot 80 by Century Oil Furnace
- 125,000 BTU/Hour Heat Rating





GHG Benefits Green Carbon Process

The Green Carbon System Provides a Solution for Recycling of Tires, Tracks, Belting:

- 1.) Provide a Green Biogenetic Fuel that can be blended and refined with natural crude oil.**
- 2.) Green Carbon Black to make new tires and reduce the need new carbon black.**
- 3.) Steel that can be recycled, saving 70% of the energy needed from iron ore based new steel.**
- 4.) Reducing the Carbon Footprint.**
- 5.) Lower Green House Gas Emissions**
- 6.) Completing the Life Cycle Assessment of the TVR for end of life treatment.**
- 7.) Reducing the burden on the environment.**