

BIODIESEL ADVANCED BIOFUEL HERE TODAY!

REDUCES CARBON, RECYCLES BYPRODUCTS
FROM PROTEIN DEMAND AND SAVES LIVES

U.S. Biomass Based Diesel

July 11, 2019



BIODIESEL[®]
America's Advanced Biofuel



ENERGY DENSITY MATTERS

SHARE OF TOTAL U.S. CARBON DIOXIDE EMISSIONS 2016

- POWER GENERATION
- INDUSTRY
- AGRICULTURE
- COMMERCIAL
- RESIDENTIAL
- TRANSPORTATION



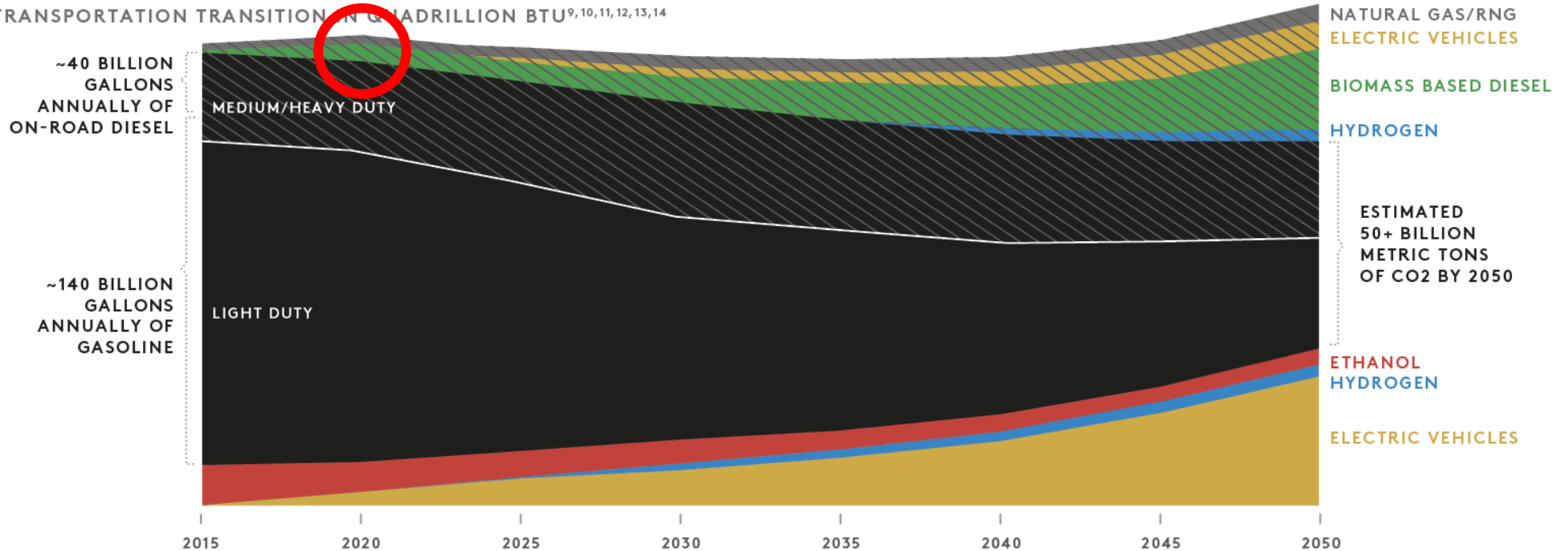
TRANSPORT EMISSIONS



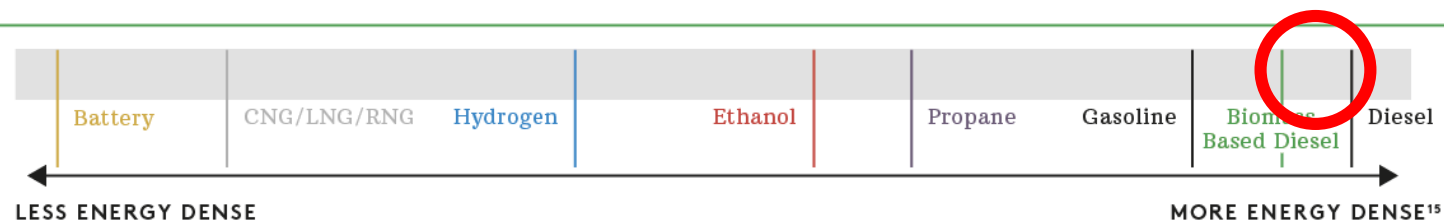
ON-ROAD TRANSPORT EMISSIONS



TRANSPORTATION TRANSITION IN QUADRILLION BTU^{9,10,11,12,13,14}



ENERGY DENSITY IN 1000 BTU PER GALLON EQUIVALENT FT³



PROVEN PERFORMANCE

ALL DIESEL VEHICLE ORIGINAL EQUIPMENT MANUFACTURER (OEMS) APPROVE BLENDS UP TO B5²⁹

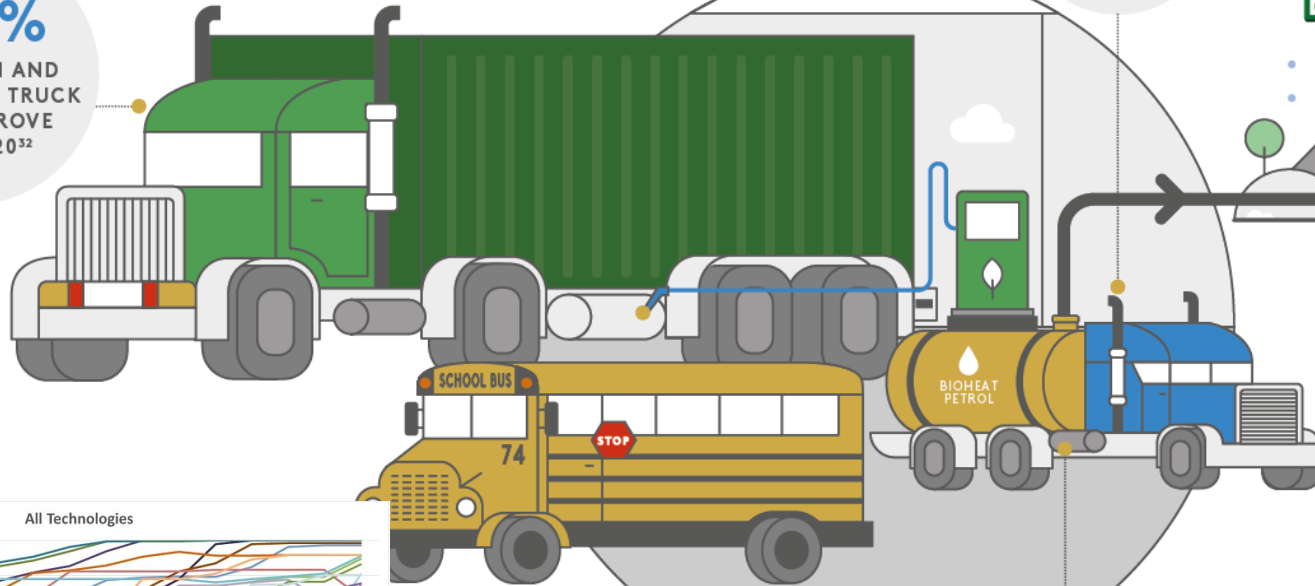


FARM, MINING, AND OFF-ROAD EQUIPMENT



EPA PHASE I AND PHASE II PROVEN LOWER EMISSIONS

90+% OF MEDIUM AND HEAVY-DUTY TRUCK OEMS APPROVE UP TO B20³²

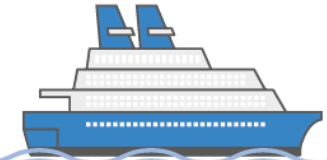


A BIOFUEL BLEND OF 20% OR HIGHER WHEN MIXED WITH ULSD BURNS CLEANER THAN NATURAL GAS

HIGHER CETANE AND LUBRICITY THAN ULSD



ALL OTHER MARKETS



IN DEMAND FOR POWER, BIODIESEL WOULD DISPLACE FUEL FROM PETROLEUM



GET BLENDED FUEL DELIVERED AND USE YOUR EXISTING TANKS³⁰

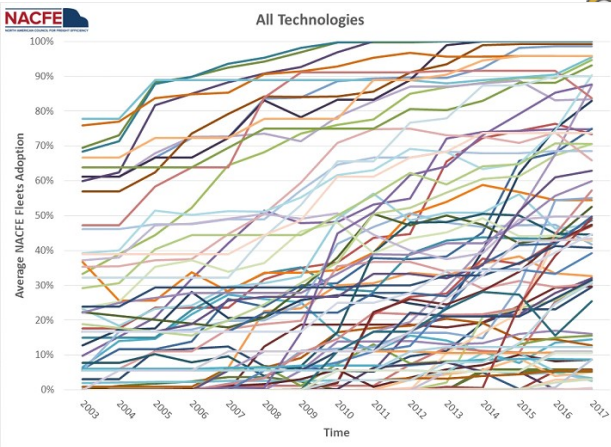


Figure 7: 85 Adoption Curves

“

“The suite of post-combustion controls for diesel engines, including Diesel Oxidation Catalysts (DOC), Diesel Particulate Filters (DPF) and Selective Catalytic Reduction (SCR), are likely to be among the most important environmental technologies of the 21st Century.”³¹

CHRISTOPHER FREY, Ph.D.

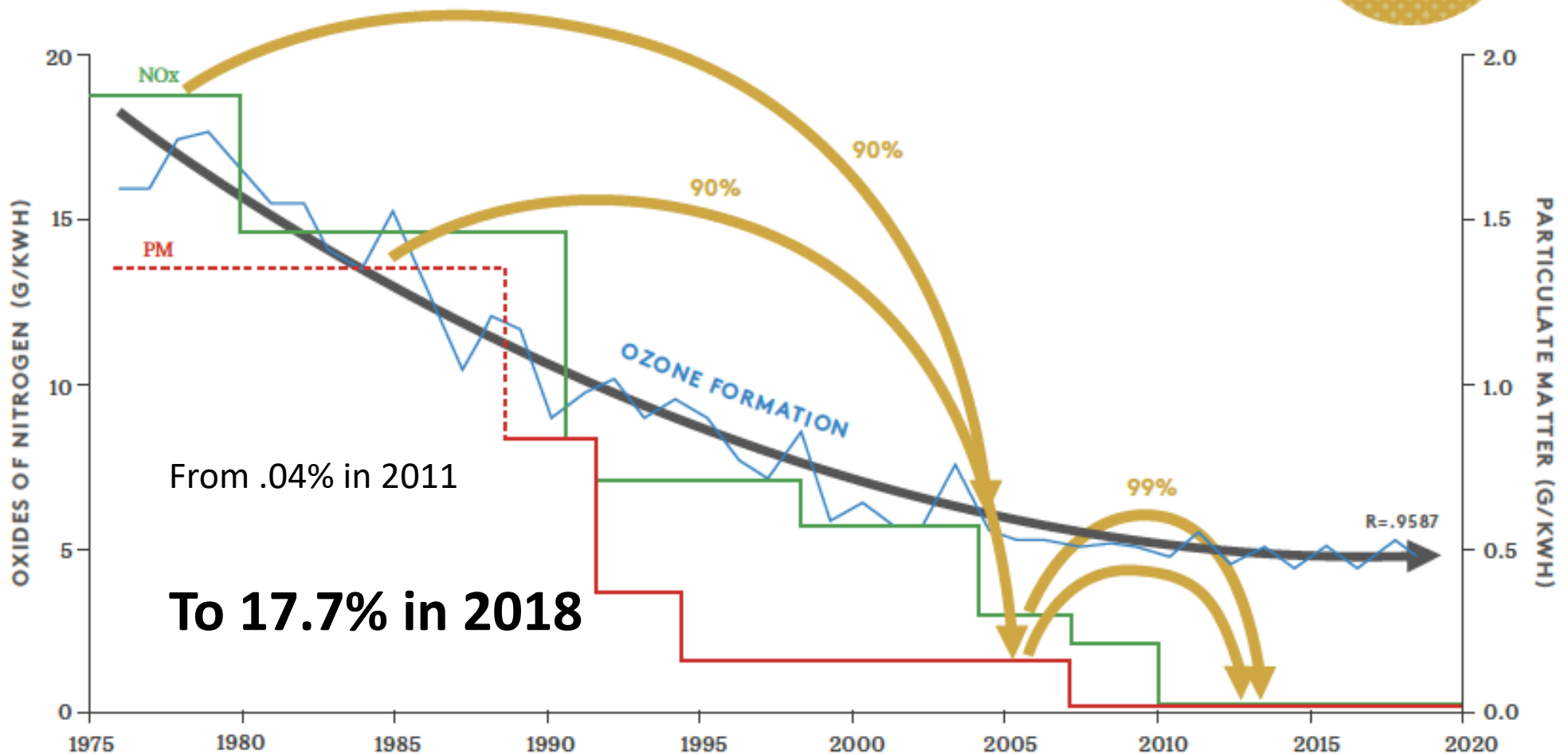
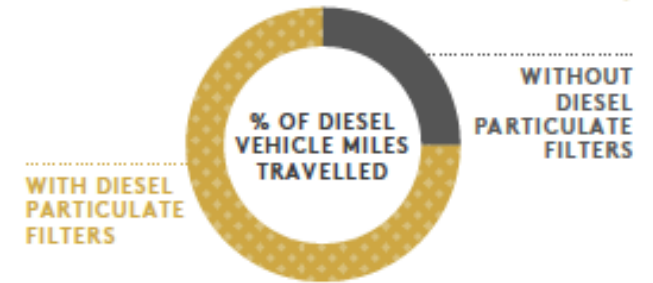
ENVIRONMENTAL ENGINEERING,
NORTH CAROLINA STATE UNIVERSITY

”

ON-ROAD DIESEL ENGINES ARE NOW 99%+ CLEANER ^{81,82,83}



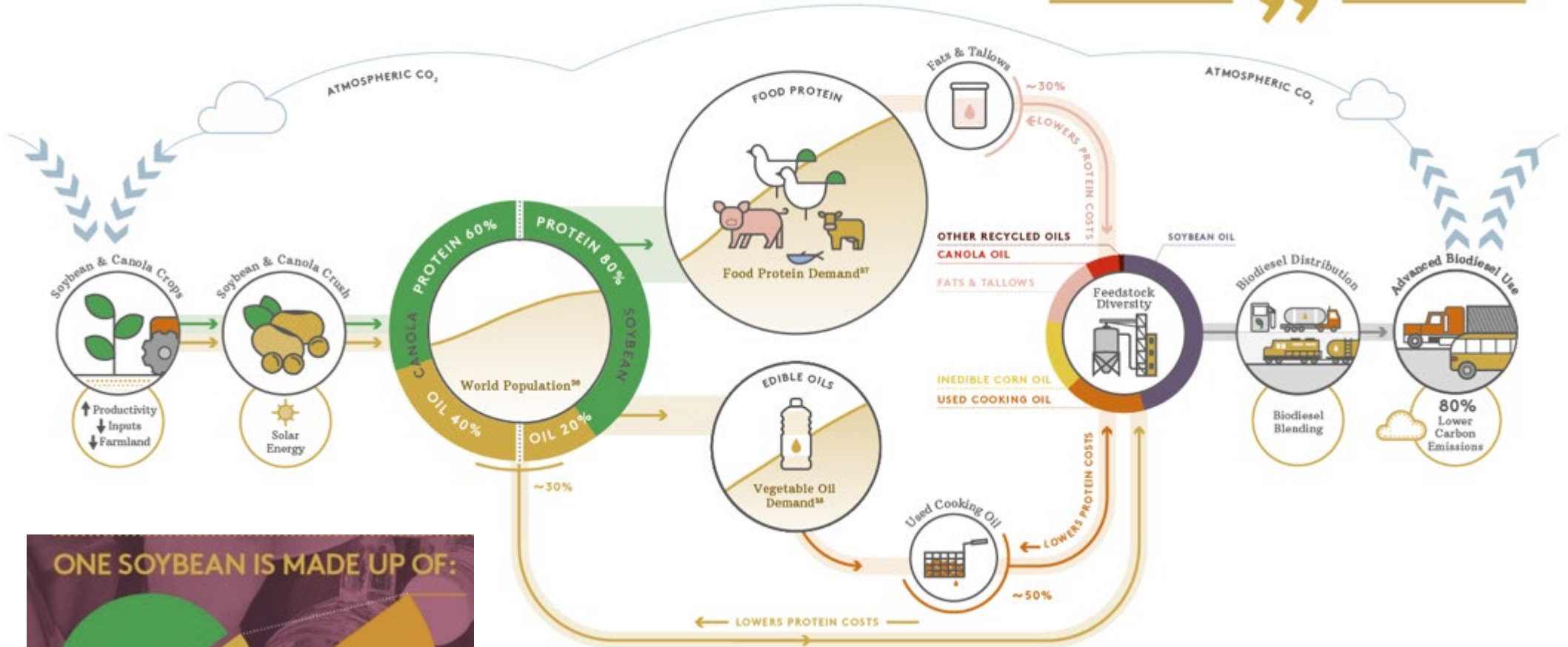
SOUTH COAST OZONE FORMULATION SENSITIVITY PER TRANSPORTATION GALLON TRACKS U.S. ON-HIGHWAY EMISSION STANDARDS OF PM AND NOX IN DIESEL ENGINES⁷⁹



FOOD AND U.S. BIODIESEL, IN HARMONY FEEDING THE WORLD

“Wealth growth will drive 78% higher meat and seafood consumption in Asia by 2050.”³⁵

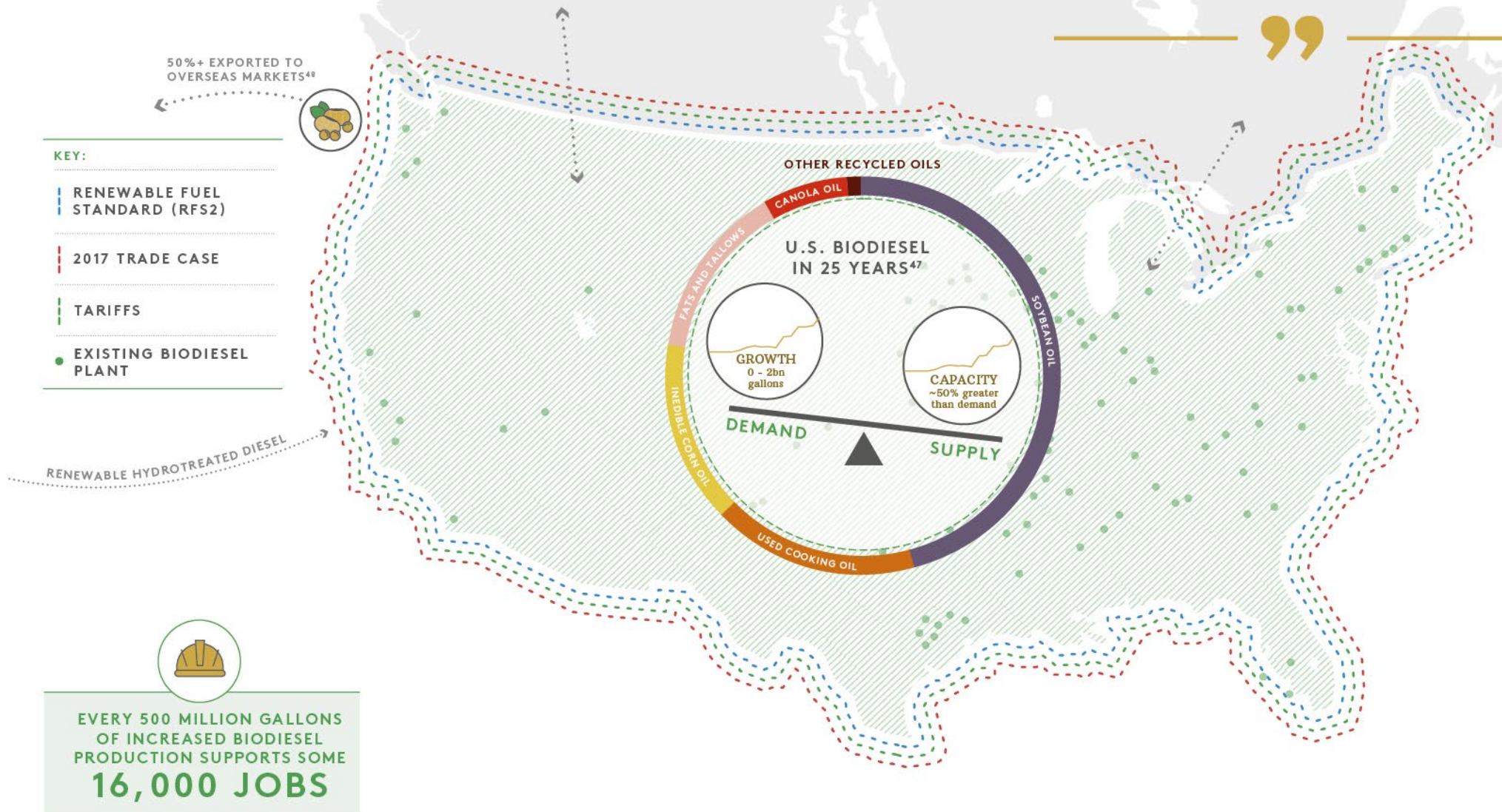
CHARTING ASIA'S PROTEIN JOURNEY
ASIA RESEARCH AND ENGAGEMENT PTE. LTD. (ARE)



WORLD PROTEIN DEMAND DRIVES U.S. BIODIESEL GROWTH

“Edible oil prices today are comparable to those in 1985, despite the advent of biodiesel.”

MIKE HASS, Ph.D.
AGRICULTURAL RESEARCH SERVICE



Thank You!

Ryan Lamberg
Sustainability Consultant
National Biodiesel Board
rlamberg@californiabiodiesel.org
(415) 418-0964



SPRING 2019