

# ADVANCEFUEL STAKEHOLDER WORKSHOP

2 JUNE 2020



285051085  
1A2/Y1.4/120/1/NL/TCPT-GEFNU01-  
1A2/Y298/Z420/S/18/NL/TCPT-GEFNU01

285051085  
1A2/Y1.4/120/1/NL/TCPT-GEFNU01-  
1A2/Y298/Z420/S/18/NL/TCPT-GEFNU01



**GoodFuels**  
Better world



# Agenda

1. Intro into GoodFuels
2. The opportunity of Marine BioFuels
3. Our fuel solutions
4. Scaling up
5. Innovation projects
6. What's next?



**GoodFuels**  
Better world





## GoodFuels is a pioneer in commercializing sustainable biofuels

- Founded in 2015, Amsterdam based
- Accelerating the energy transition in heavy duty transportation sectors
- Serving Marine, Road and Rail
- Serving cargo owners and creating a market through GoodShipping
- Accelerating the industry and product innovation through own Innovation team
- Uncompromised sustainability



**GoodFuels**  
Better world



# Application of the strictest sustainability standards is assured through the independent sustainability board



Barbara Bramble



Prof. Martin Junginger



Universiteit Utrecht



Prof. Patricia Osseweijer



NO FOOD/FEED – WASTE/RESIDUE ONLY –  
NO BIODIVERSITY LOSS – NO DEFORESTATION – MIN 70% CO<sub>2</sub>  
REDUCTION - NO (I)LUC – POSITIVE SOCIAL IMPACT

BARBARA BRAMBLE – FORMER CHAIRMAN RSB:

*“GoodFuels has a wonderful corporate goal: to get rid of fossil fuels. We are proud to partner with game-changers such as GoodFuels.”*

GoodFuels is certified by:



**GoodFuels**  
Better world



**The GoodShipping Program empowers cargo owners to take immediate control and choose a fossil free pathway to ship their goods**

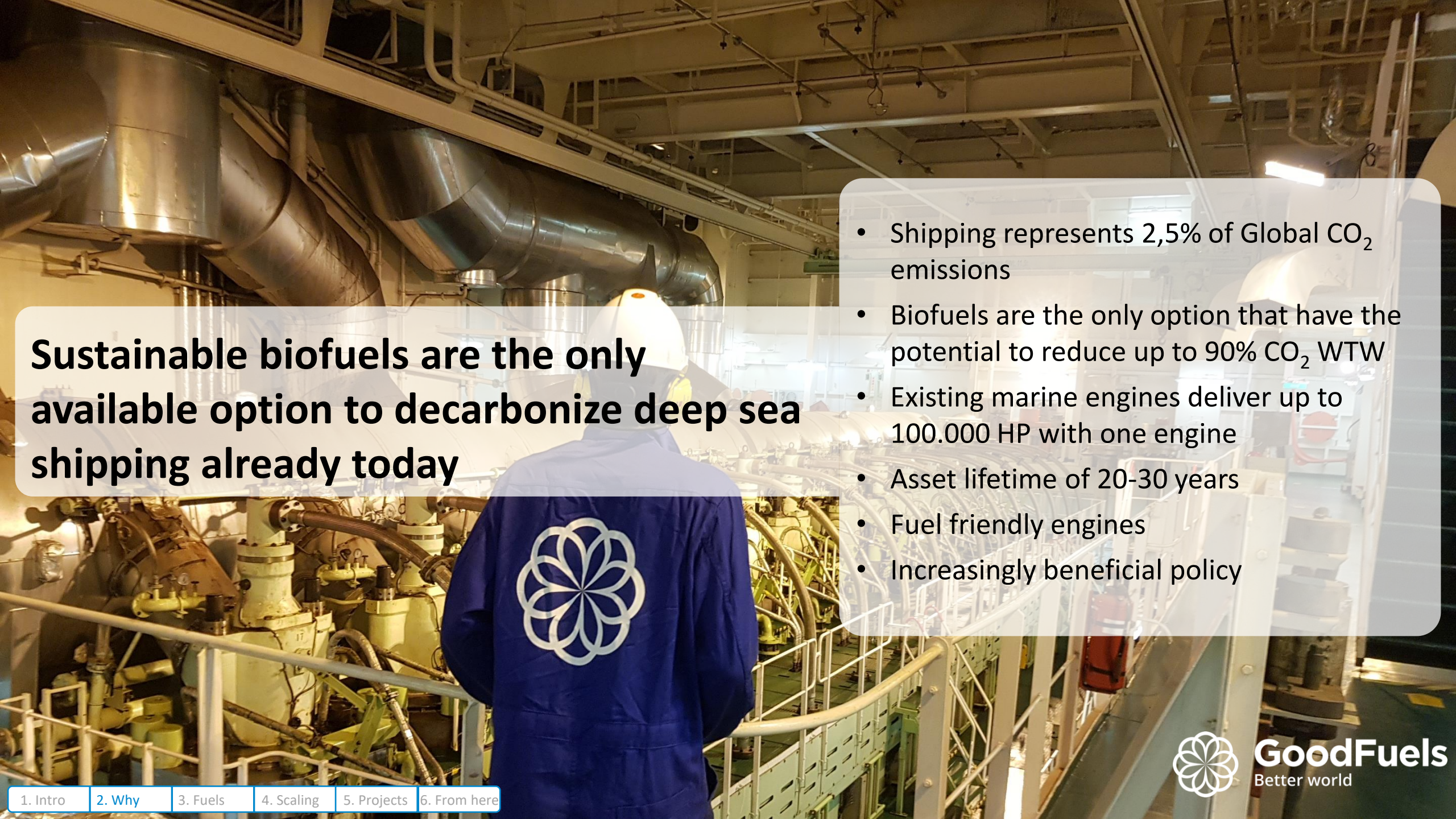
### How does the program work?

1. Cargo owner decides on tradelane and volumes to be shipped on biofuel
2. GoodShipping calculates the footprint and corresponding fuel volumes
3. Cargo owners pay te GoodShipping fee
4. GoodShipping delivers the aggregated fuel volume to container vessels operated by selected operators
5. Cargo owner receives audited impact statement



**GoodFuels**  
Better world





# Sustainable biofuels are the only available option to decarbonize deep sea shipping already today

- Shipping represents 2,5% of Global CO<sub>2</sub> emissions
- Biofuels are the only option that have the potential to reduce up to 90% CO<sub>2</sub> WTW
- Existing marine engines deliver up to 100.000 HP with one engine
- Asset lifetime of 20-30 years
- Fuel friendly engines
- Increasingly beneficial policy



**GoodFuels**  
Better world



## Different needs require different types of fuels – continuous development is required to scale

- Shipping is a conservative industry
- GoodFuels started with HVO in 2015 and built further on that
- In 2018 GoodFuels Bio Fuel Oil was launched with D/S Norden
- Since then GoodFuels has supplied this fuel as a 100% drop-in biofuel to a number of ships in different segments.
- Experience with the fuel is continuously growing with e.g. different trials, different focusses and different engine makers
- The available volumes are rapidly selling out

Clients include:

**NORDEN**

**CMA CGM**

**JUMBO**

**Port of Rotterdam**

**Boskalis**

**DJN**

**Jan De Nul GROUP**

**L**

**Loodswezen**

**NYK LINE**



**GoodFuels**  
Better world



## Scaling Bio Fuel Oil first requires increasing the supply of similar products

- GoodFuels works with different residual streams from a range of industries including:
  - Food
  - Biofuels
  - Cosmetics
  - other industrial processes
- While developing and testing the current GoodFuels Bio Fuel Oil a lot of knowledge was gained regarding product specifications and specific handling

### ISO 8217 Residual fuel specification

Viscosity	10-380 cSt
Density	850-990
Flash point	Min. 60 °C
Acid number	Max 2.5 mg KOH/g
Ash	Max 0.15%
Pour point	Max 30 °C



**GoodFuels**  
Better world





## Scaling further requires a lot of testing with different feedstocks and conversion technologies

- The existing GoodFuels BFO can serve as an ideal carrier or blending component for new marine biofuels
- All pathways that produce diesel-type fuels are in scope and interesting to increase availability
- Often a Marine application allows the use of non- or mildly upgraded oil
- GoodFuels does not bet on a single pathway of feedstock
- GoodFuels has the testing experience needed to qualify for a marine application
- Many privately and publicly funded projects are being executed to scale as fast as possible



**GoodFuels**  
Better world





## Scaling also requires continuous supply chain improvements to guarantee quality and efficiency

- Since 2020 GoodFuels operates a dedicated Bio-Bunkerbarge
- Terminal capacity is increasingly being added to provide the required response time to clients
- Blending facilities are being added to allow for blends between different biofuels and with fossil fuels



**GoodFuels**  
Better world



## The most concrete scaling project is the demo-plant for wood residue based marine fuels by BTG and GoodFuels



- This plant will be using the Fast Pyrolysis Oil produced at Empyro in the Netherlands as a feedstock
- Upgrading will be done to the minimum required quality threshold
- Demo scale facility will have a 1000mt/year output capacity
- Opening is expected in 2023
- Commercial scale is expected to commence in 2027/2028
- The work is partly privately funded and also part of different publicly funded projects





Hydothermal Liquefaction



Sewage sludge

Project partners:



HALDOR TOPSØE 



**GoodFuels**



AALBORG UNIVERSITET



Karlsruher Institut für Technologie



**SINTEF**



CENER

CENTRO NACIONAL DE  
ENERGÍAS RENOVABLES



etaflorence  
  
**renewable**  
energies



**CPERI**  
Chemical  
Process and  
Energy  
Resources  
Institute



**GoodFuels**  
Better world

<https://www.nextgenroadfuels.eu/>





Pyrolysis



Saw dust

Project partners:



**GoodFuels**  
Better world

<https://www.music-h2020.eu/>





HORIZON 2020

IDEALFUEL



Solvolysis



Lignin

Project partners:

TU/e

VARO

uniResearch



GoodFuels

WIN G2  
Winterthur Gas & Diesel

BLOM



thyssenkrupp



ertoro

OWI  
affiliated to RWTH Aachen



CSIC

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

TEC4  
FUELS



GoodFuels  
Better world





Thermo - biochemical



Biomass waste

Project partners:



RINA CONSULTING



CPERI  
Chemical  
Process and  
Energy  
Resources  
Institute



National Technical  
University of Athens



ENVIRONMENT  
PARK Parco Scientifico  
Tecnologico per l'Ambiente



CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS



Bio Base Europe  
Pilot Plant



GoodFuels  
Better world





ZUID-NEDERLAND



Pyrolysis



MSW & others

Project partners:



GoodFuels  
Better world



# RENEWELL



Catalytic upgrading



Pyrolysis oil  
(FPO from wood residues)

Project partners:





CALIBRA



Pyrolysis



Lignin

Project partners:



ECN

TNO

innovation  
for life



GoodFuels  
Better world





**GoodFuels will continue to scale as fast as possible to supply the world's ships with the most sustainable fuels available**

- GoodFuels looks forward to collaborating with different suppliers using different feedstocks and technologies without compromising quality or sustainability
- This includes:
  - Sourcing residual products
  - Offtake of future plants
  - Participation in future plants
  - Co-creation and commercialization



**GoodFuels**  
Better world



Rianne de Vries  
**Manager Business and Government**



+31 (0) 6 26272548  
[rienne@goodfuels.com](mailto:rienne@goodfuels.com)

