



RENEWABLE FUELS WITHIN THE ENERGY INDUSTRY

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OUTLINE



- **Phillips 66 Whitegate Refinery**
- **European Renewable Energy Targets - Legislation**
- **Meeting the Renewable Requirement for Transport (RES (T)) Target and Fuels Quality Directive (FQD)**
- **What is renewable diesel?**
- **Summary**



RENEWABLES AT WHITEGATE



Vegetable Oil



Renewable Diesel



Crude Oil

2006: First commercial production of renewable diesel at Whitegate



OVERVIEW OF WHITEGATE REFINERY



- Ireland's only crude oil refinery
- Produces >35% of Ireland's petrol, diesel, heating oil



Phillips 66 : Providing Energy, Improving Lives



WHITEGATE REFINERY: PRODUCTS AND MARKETS



International Crude Supply



Jetty



Crude Oil Storage

*Also produce
- electricity & steam for own use
- Sulphuric Acid to market*

Full range of products for inland market including Petrol and Renewable Diesel

Road Tanker



Irish Ports



Feedstock for Phillips 66 Refineries in UK & US



Straight Run Atmospheric Residue





EU 2020 RENEWABLE ENERGY TARGETS



- **Renewable Energy Directive (RED)**
 - **16% National Renewable Energy Target**
 - RES-E : Electricity 40% (20.9%)*
 - **RES-T : Transport 10% (4.9%)* - mandated target**
 - RES-H : Heat 12% (5.7%)*
- **Fuels Quality Directive (FQD)**
 - 6% GHG intensity reduction on transport fuels by end 2020
 - Very little focus
 - Estimate at best Ireland can achieve 4%
- **Risk of missing all targets both national and sectorial**

* Progress to end 2013 / SEAI



TRANSPORT SECTOR TARGET – RES (T) 10%

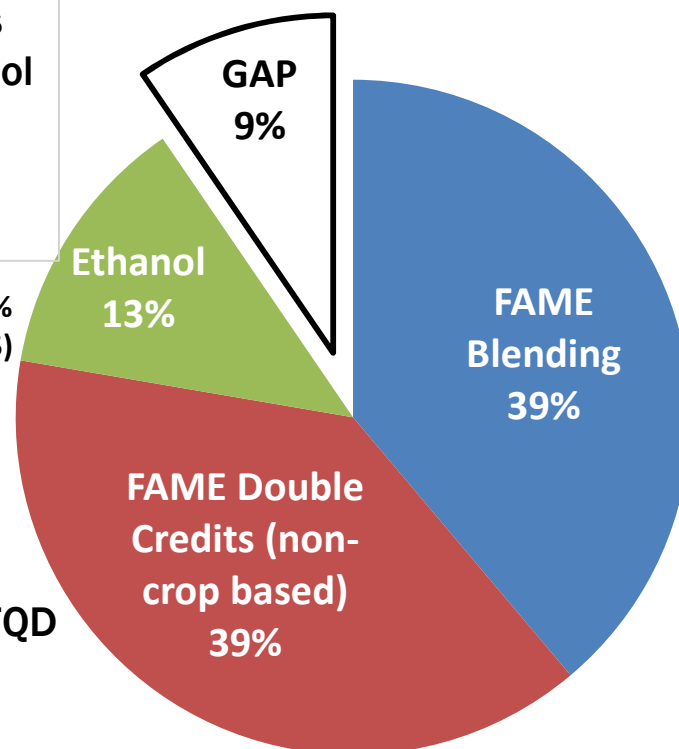


Traditional Biofuel constraints

- Engine makers limit Ethanol to 10%
- EU limit on 1st generation feedstocks

Based on 5% Ethanol (E5)

double credits are problematic as they don't help with FQD



FAME – Fatty Acid Methyl Ester

- Used Cooking Oil
- Tallow (meat industry waste)

% are contribution to overall 10% target

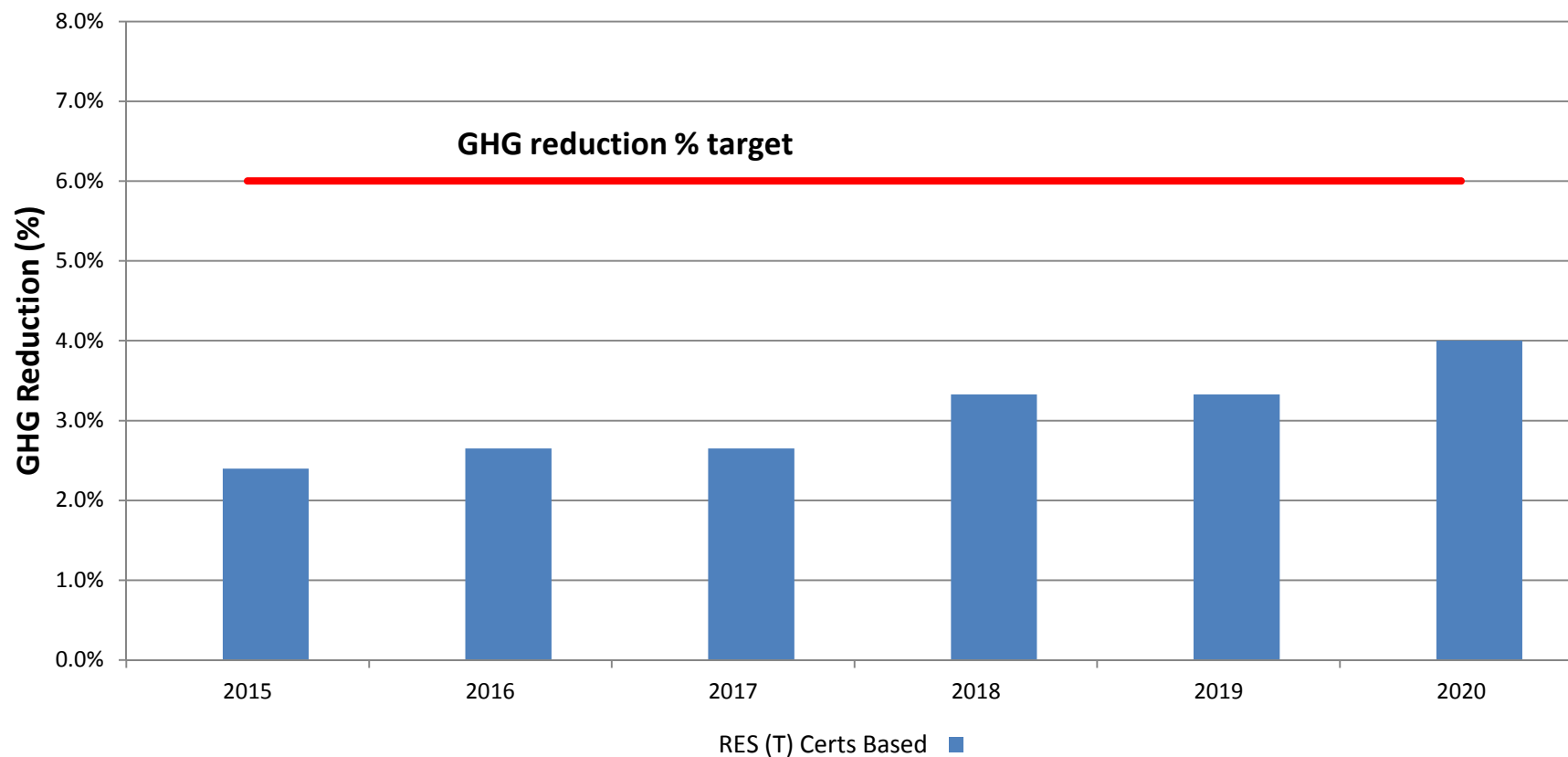
Solution: Renewable Diesel - Hydrotreated Vegetable Oil (HVO)



FUELS QUALITY DIRECTIVE (FQD)



Actual Volumes placed on market

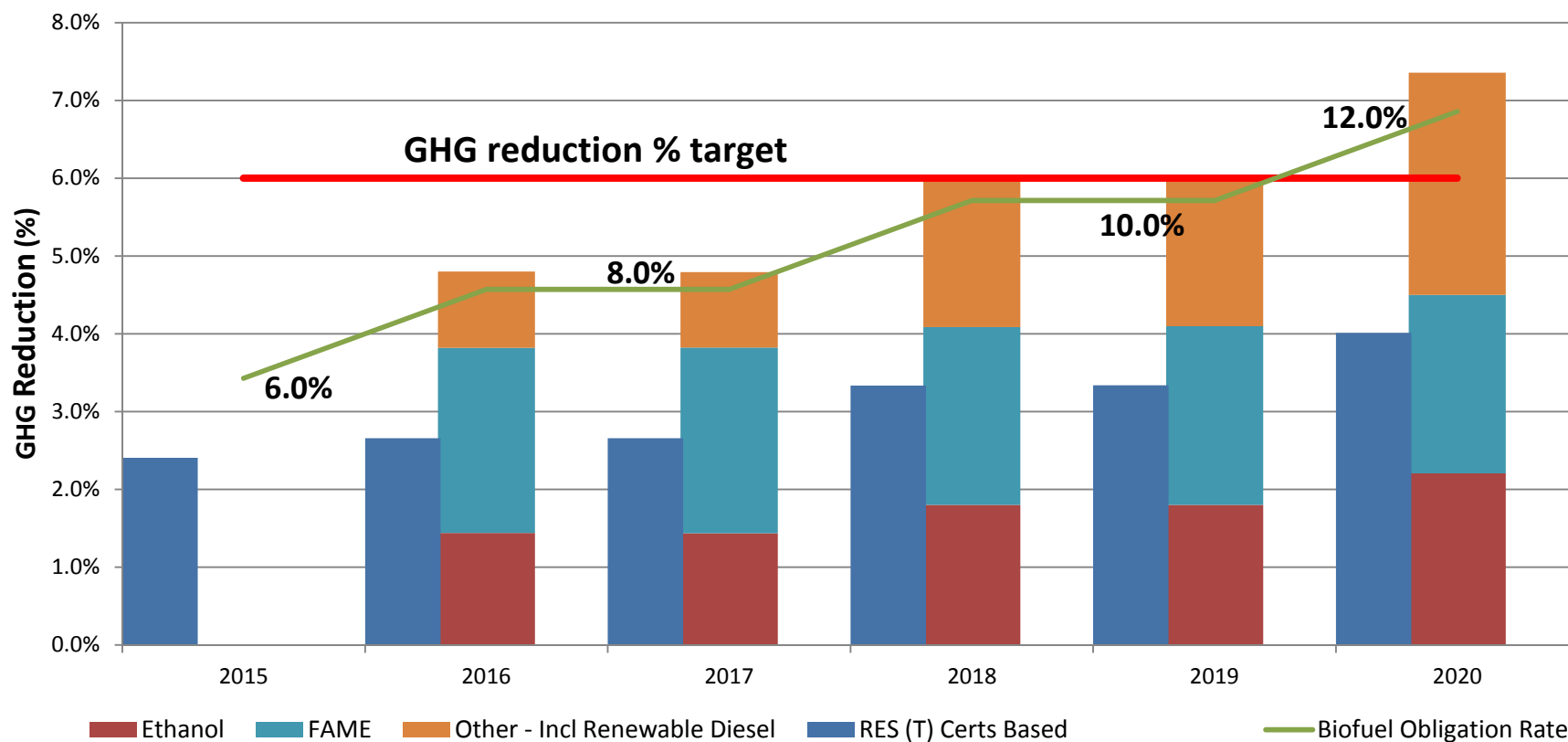




FUELS QUALITY DIRECTIVE (FQD)



Actual Volumes placed on market





WHAT IS RENEWABLE DIESEL?



- Indistinguishable from fossil-based diesel fuel
- Manufactured in a conventional refinery process unit known as a hydrotreater
- Renewable feedstock can be any type of vegetable oil and many waste oils
 - Tallow from meat rendering plants, currently exported as a waste or used as a fuel
 - Used Cooking Oil from the restaurant industry
 - Non food crop based advanced biofuels such as algae
 - Research underway to determine the viability of converting Farm/Dairy Waste to a liquid biofuel rather than biogas

Renewable Diesel is a more flexible product than Biodiesel



SUMMARY



- Ireland is challenged in meeting RED and FQD targets
- Potential costs to the Exchequer of non-compliance are high
- Indigenous waste feedstocks could be used for renewable diesel production further enhancing Ireland's energy supply security
- Whitegate Oil Refinery can assist with solving the transport issue and could play a key role in closing the gap in other national targets