

International experience on bio-fuels

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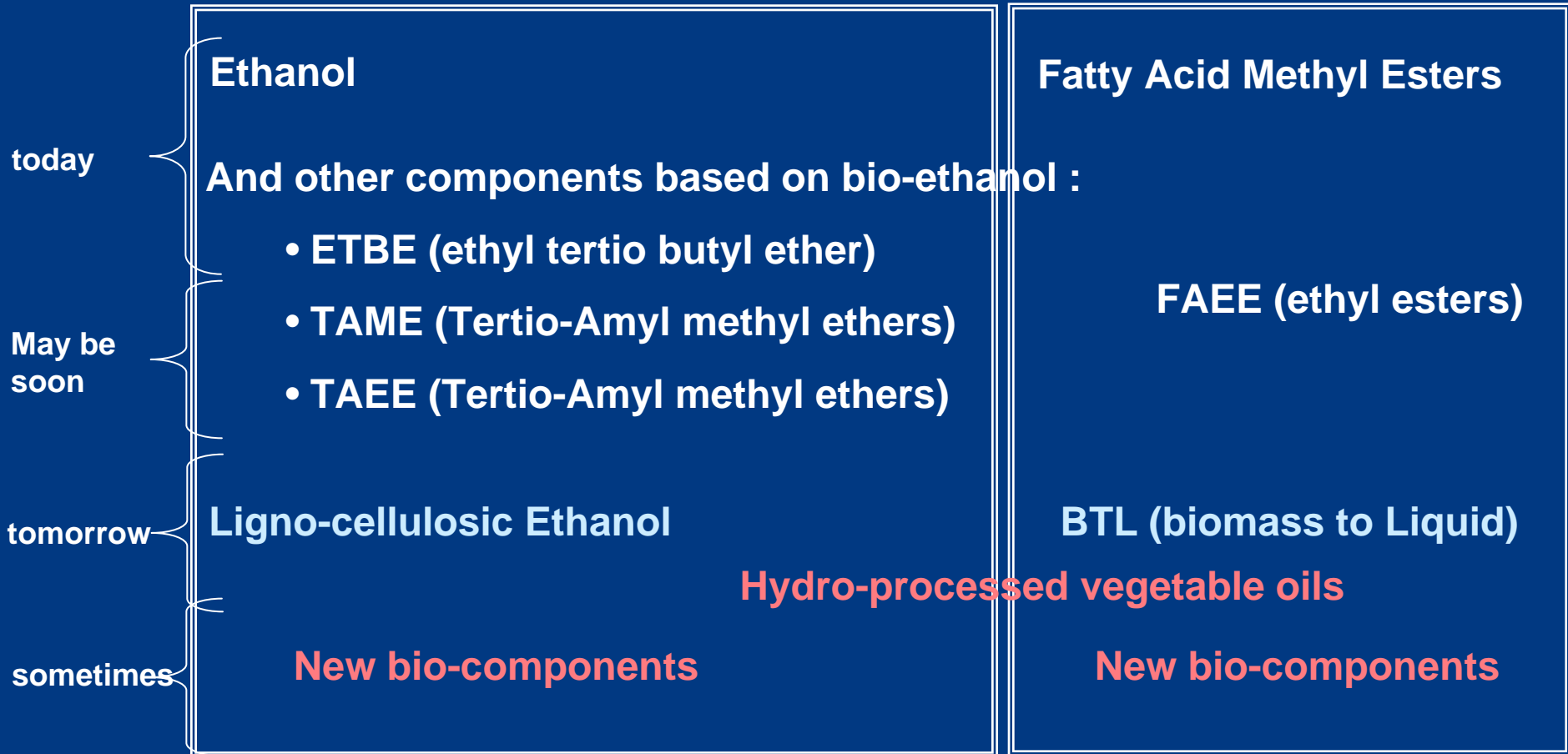
EECA conference, April 21st 2005



Bio-fuels: What are they ?

Gasoline components

Diesel components



And options that we do not support..

Gasoline components

methanol

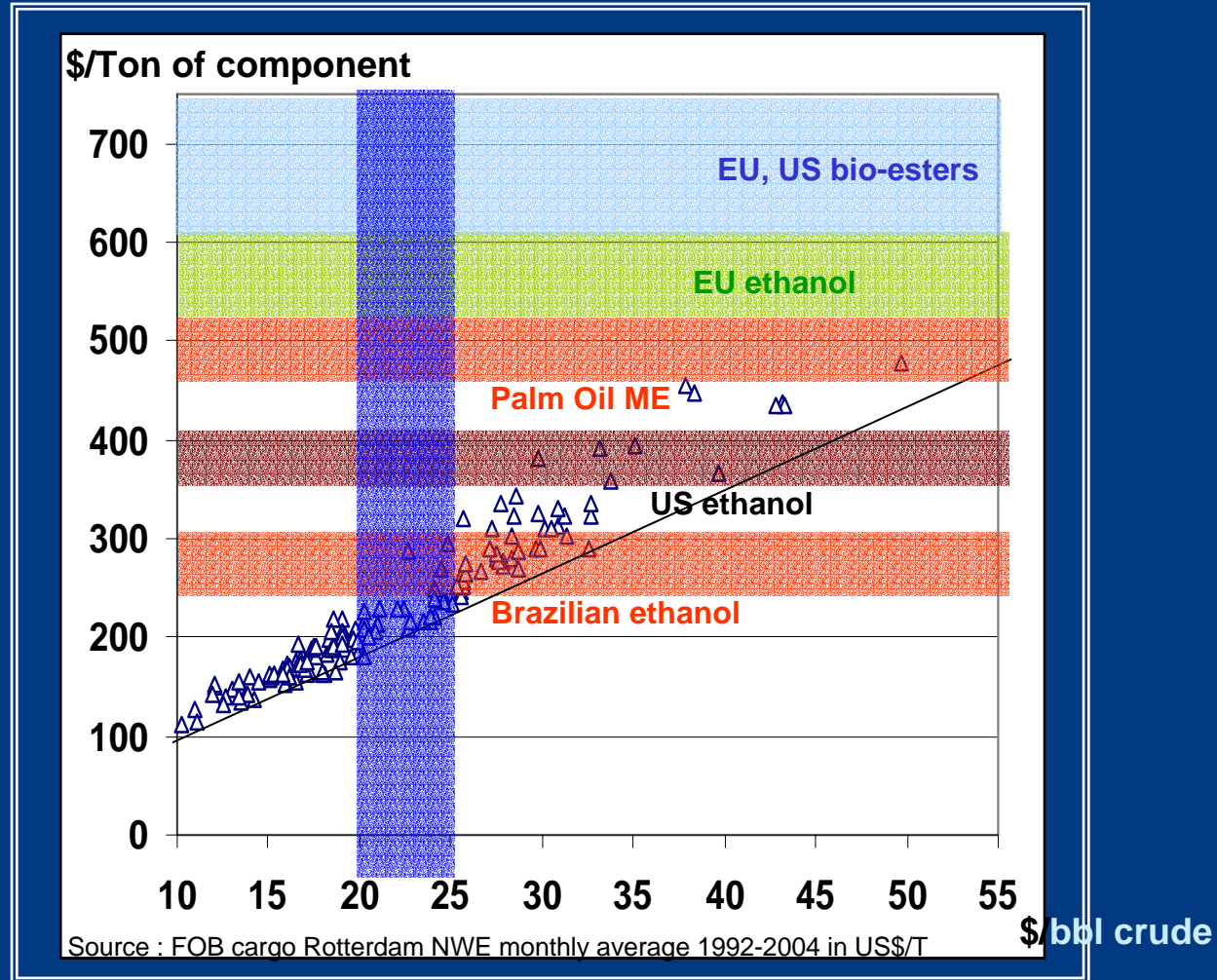
Diesel components


Straight vegetable oils
Ethanol in diesel

**Fuel components have to be acceptable to OEMs and
meet Fuels HSE standards**



How much do bio-fuel components cost ?



**Bio-fuel components are more expensive than oil-derived fuels
(in our LT scenarios)**



What are the options to offset the gap ?



Customers accept to pay a premium

Fuels are incentivised

Bio-fuel components are mandated

- Consumers like the bio-fuels concept but are not prepared to pay a premium
Instead consumers' experience is that alternative fuels come at a discount..
Hence the most acceptable option is a seamless introduction

Bio-fuels must meet our customers' expectations



Then how has it worked in the world ?

	No incentive	Incentives to producers	Incentives to Distributors
Mandates	Brazil now	Brazil initial	Thailand
Incentives	-----	USA	USA Ge, Swe, Sp..
Incentives + Quota	-----		Fr, It

Shell's preferred option is for a free, voluntary introduction



Bio-fuels are being promoted in our key markets of today and tomorrow.

Key drivers (USA) :

- . Oxygenate Mandate
- . Renewable Fuel Standard
- . Supply security
- . . Feedstock – corn, waste
- . No bio-diesel support today

Key drivers (EU) :

- . EU Bio-fuel targets
- . Kyoto commitments (CO₂)
- . Renewable Energy policy
- . Feedstock – straw, waste
- . Fit with Diesel growth
- . Ethanol used as ETBE

Key drivers (Asia-Oceania) :

- . China – fuel needs
- . India, Thailand – ethanol mandate
- . Environment policies in Japan
- . CO₂ credits
- . Agricultural/ social issues (e.g. market stability for crops)
- . Feedstock – veg oil, waste

Key drivers (S. America) :

- . Brazil – agriculture
- . Push for a global ethanol market
- . Feedstock - sugar cane
- . Ethanol production stable at 10MT but huge potential for growth ?



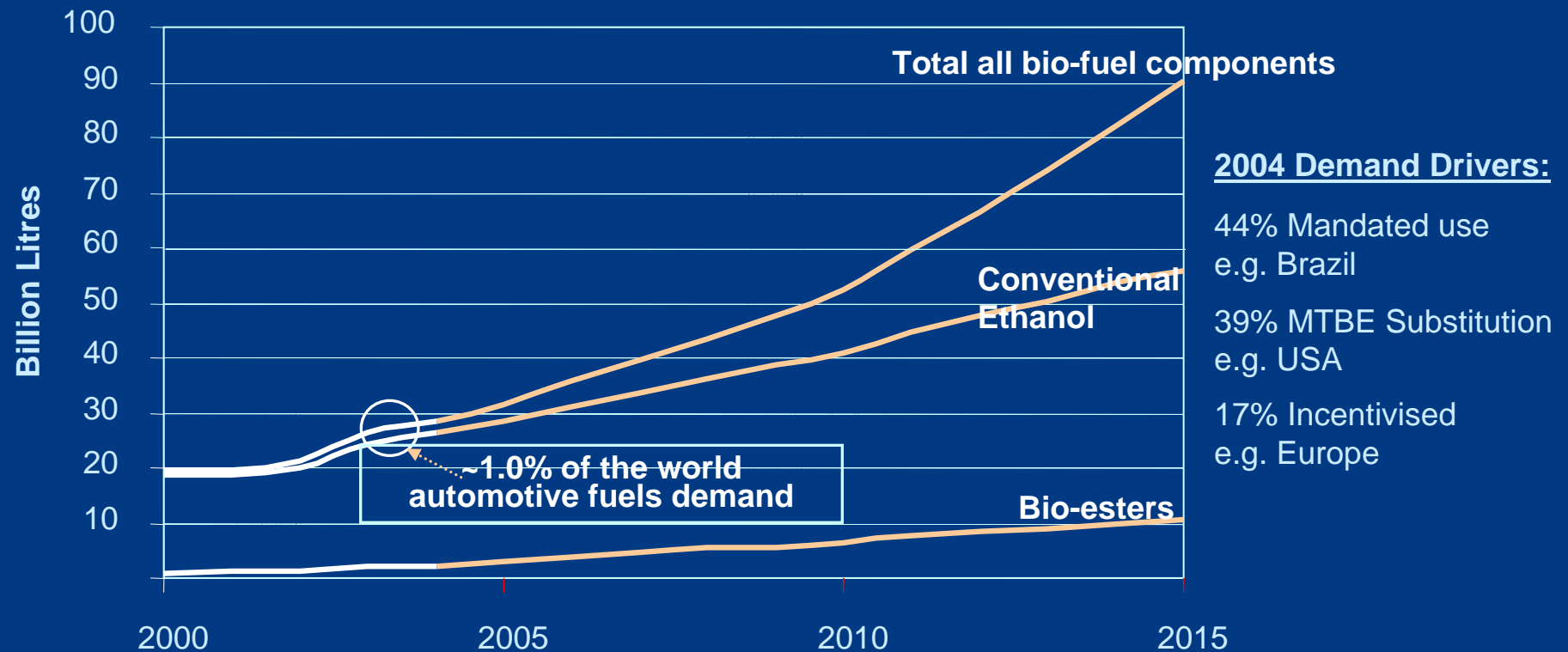
In red: countries with forthcoming bio-fuels legislations

By 2010, 1 in 3 gallons of fuel sold could contain bio-component increase



Sources: US - EIA, Japan - IEJ; EU - Concawe

How much bio-fuels tomorrow ?



Source: OXF "ase scenario" estimates based on Government policy decisions



Shell's position on bio-fuels

Bio-fuels are our only option today to reduce automotive fuels WTW GHG emissions, although factually, biomass is better suited to use in power and heat generation as this delivers a greater CO2 reduction per hectare of land.

Bio-fuels are part of Shell's strategic alternative fuels options.



Shell invests in the development of bio-fuel components that will be greener (GHG), cheaper and will no longer compete with food feedstock.

Level playing field without market distortion

Shell is today the largest distributor of bio-fuel component in the world

Source: OXF estimates based on Government policy decisions



Key Success Factors for bio-fuels

A trouble free implementation of bio-fuel initiatives relies on two pillars :

😊 **Fit-for-Purpose Inter-Industry specifications**

} Validated by key stakeholders (incl. OEMs)

😊 **Best Practices**

} •Quality Assurance System (eg. ISO-9002)
-- **Specific Best Practices, guidelines, standards (share OU's experience)**
-- Roles and responsibilities
-- Monitoring, Incident reports and audits

- Ideally, the national fuel specifications should cover the use of bio-components (eg. EN-228 or EN-590)
- In complement, Shell QA process looks on a case-by-case basis, at the specific Shell applications (eg. Additive interaction).

Source: OXF estimates based on Government policy decisions



In conclusion, fuels at the heart of the energy debate

Emissions



Energy security

Growing demand



Customer needs

And bio-fuels are a key component..



CO₂

2050 ???

2+ billion vehicles

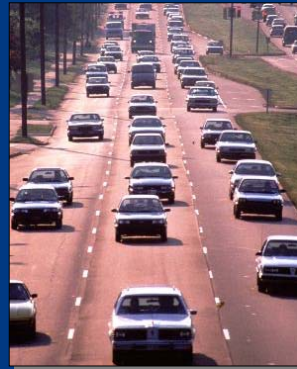
2-3,000 million tonnes carbon



2000

900 million vehicles

1000+ million tonnes carbon



1950

80 million vehicles

~70 million tonnes carbon

