A3PS

Rethinking Propulsion.

Alternative Transport Fuels: Market overview and challenges for the fuel industry

Walter Böhme

Transport Fuels: Crucial factor and driver towards sustainable mobility

R&D-projects, research institutions and funding programs in Austria, Europe and global cooperation within the International Energy Agency

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in cooperation with bmvit

Content

- Drivers and Barriers for Alternative Fuels
- Alternative Fuel Options
- Status and Outlook
- Summary

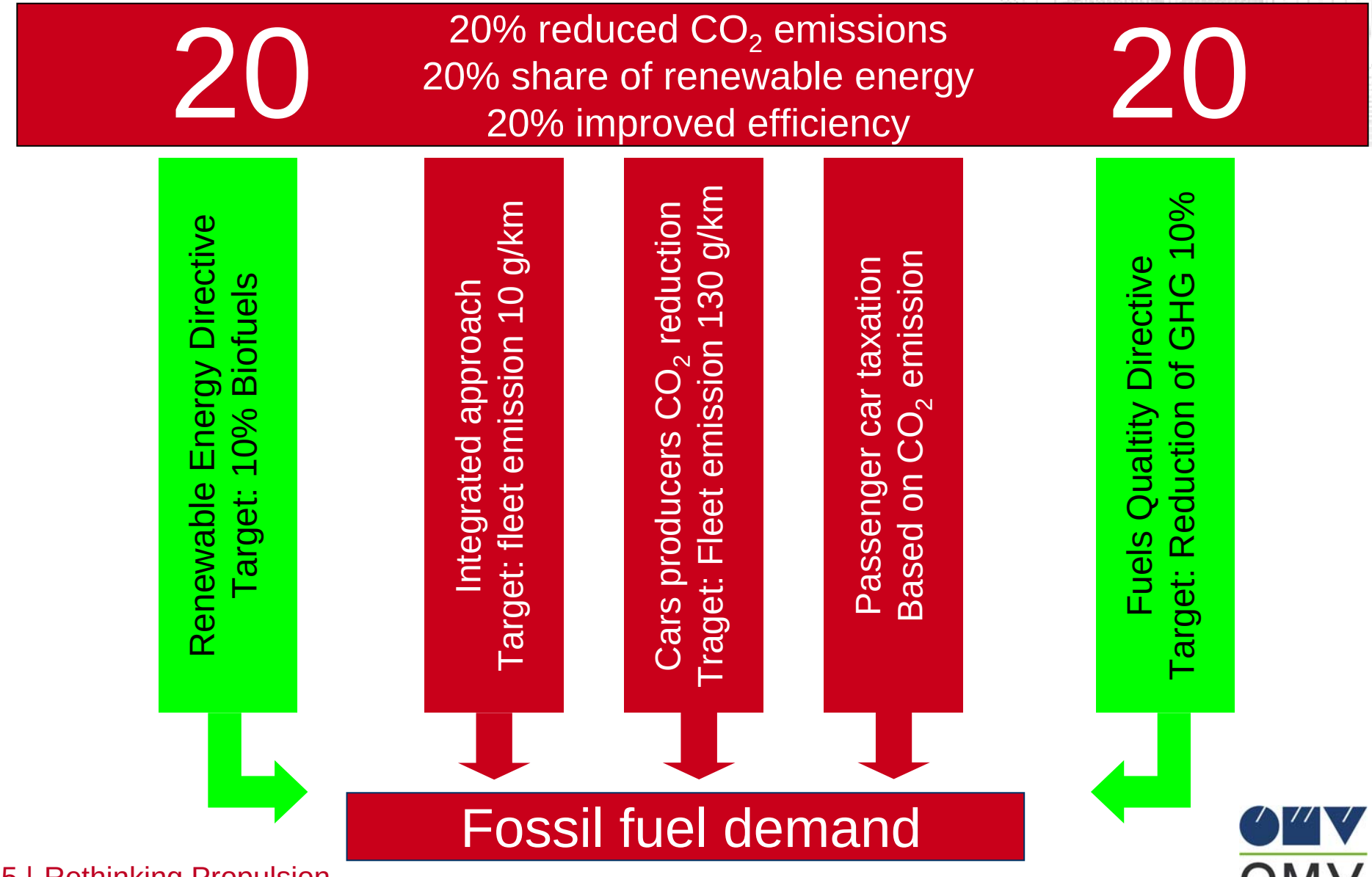
Drivers for Alternative Fuels

- **Security of supply**
  - Reduce petroleum dependence in transport sector.
  - How much fossil fuel can be substituted?
  - Is the production of the fuel alternative completely domestic or is import necessary?
- **Environmental impact**
  - Does the fuel offer emission reduction potential?
  - Is CO_2 balance better or worse than other alternative fuel options?
- **Supporting the rural economy**
  - Use of alternative resources like biomass.
  - Is the production of the fuel alternative completely domestic or is import necessary?

Drivers for Alternative Fuels

- Security of supply
  - **Energy Policy**
- Environmental impact
  - **Environmental Policy**
- Supporting the rural economy
  - **Agricultural Policy**

EU CO_2 Framework



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Renewable Energy Directive-RED **COM(2008)19**

- 20% share of renewable energy in overall EU energy consumption - individual targets for each MS (~ +10%)
- **10% share of biofuels in each MS transport petrol and diesel consumption by 2020.**
- Commission will develop the methodological principles and sustainability criteria values

Renewable Energy Directive
Target: 10% Biofuels

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Fuel Quality Directive-FQD **COM(2007)18**

- Minimum specifications for petrol and diesel fuels for use in road and non-road mobile applications
- Specifications were established for health and environmental reasons
  - Limits for sulfur, vapour pressure, poly aromatic hydrocarbon, etc. and
  - **Fuels with reduced carbon intensity (-10% CO_2 in 2020)**

Fuels Quality Directive
Target: Reduction of GHG 10%

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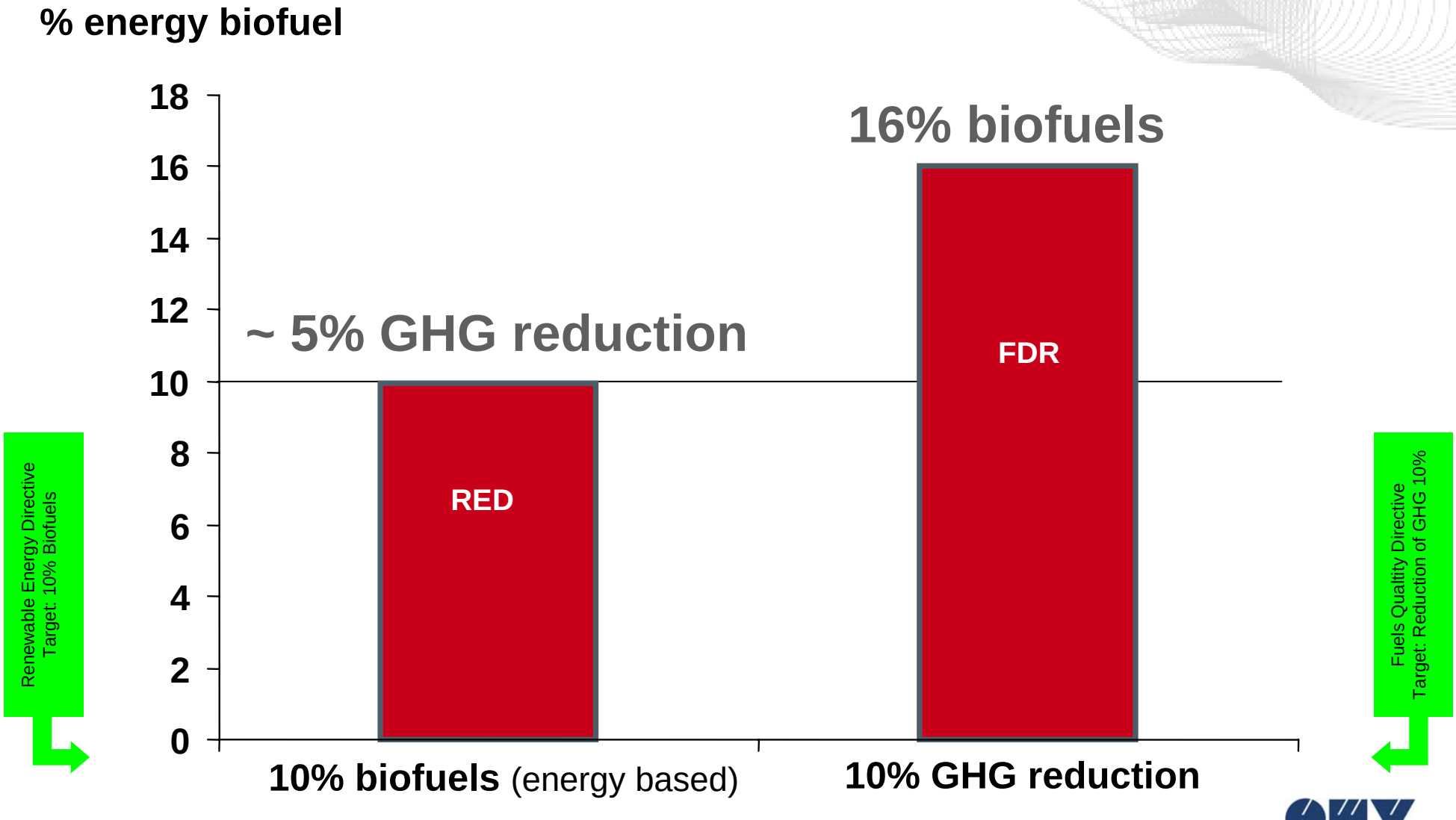
The 10% GHG reduction could result in an average of at least 16 % bio-share in road fuels by 2020…

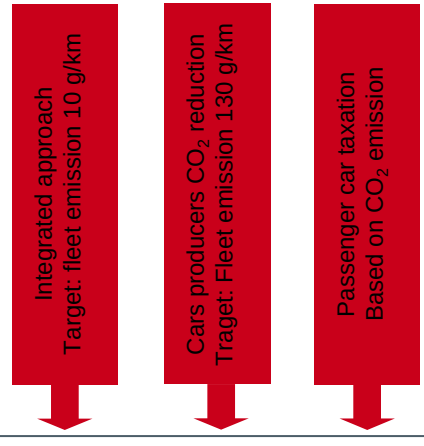


Source: Concawe

European Commission's legislative proposal on CO_2 reduction from cars **COM(2007)856**

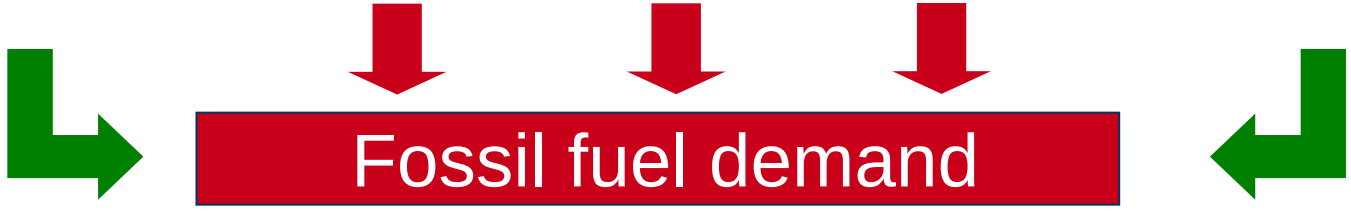
Integrated approach to reduce CO_2 emissions from light-duty vehicles

- **Target: 120g/km in 2012**
  - 130g/km through technologies (car manufacturer e.g. engine)
  - 5g/km through bio fuels
  - 5g/km through complementary measures

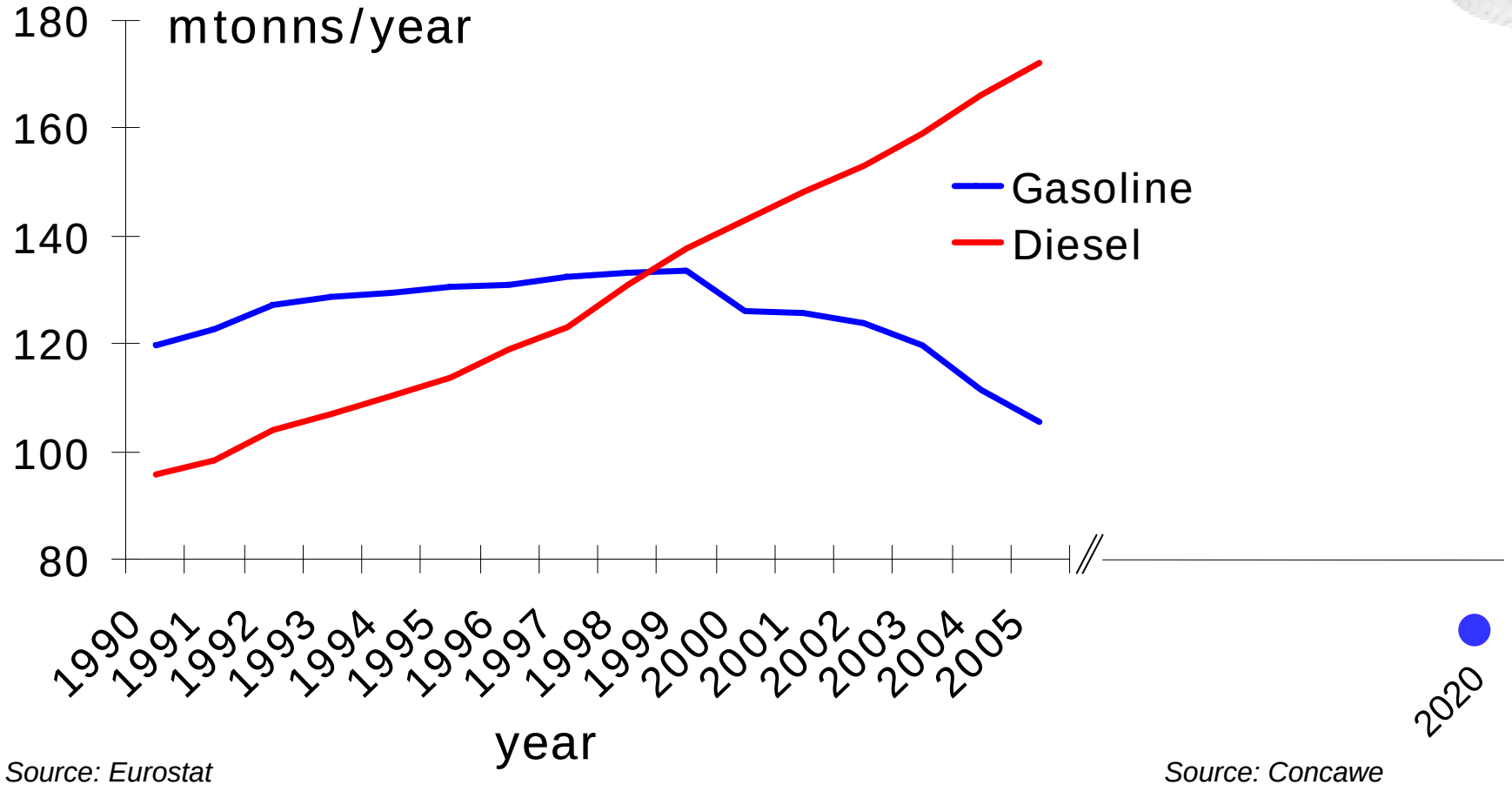


Impact of CO_2 Legislation

- Car technology
  - further shift to diesel, plug in hybrid, alternative energy cars, ……
- Consumer behavior
  - more efficient cars, eco driving, less mileage,……
- Fuel demand
  - tighten diesel:gasoline ratio
  - reduced fuel demand
    - considerable reduced fossil fuel and
    - increased alternative fuel demand.



The EU road fuel market continues to demand more diesel at the expense of gasoline



Source: Eurostat

Source: Concawe

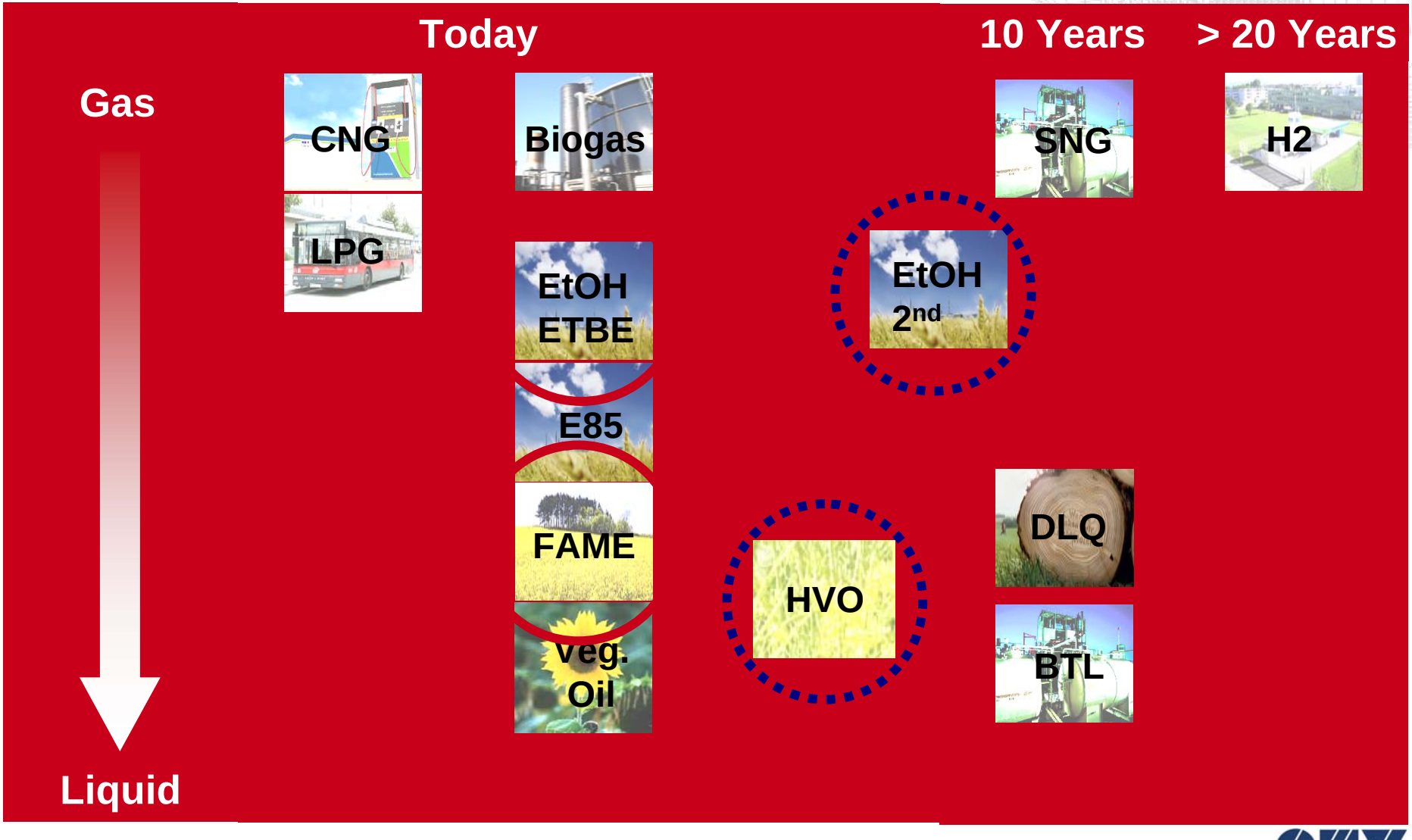
Main Barriers for Alternative Fuels

- **Infrastructure**
  - Does the fuel require a new infrastructure?
  - Is it possible to blend alternative fuel with conventional fuel?
- **Powertrain**
  - Does the fuel require adapted or a new propulsion technology?
  - Is it possible to use the fuel in the existing car fleet?
- **Sustainability**
  - Economics - Ultimately must be competitive with hydrocarbons
  - Social - Cannot use food crops as a feedstock
  - Environmental – Lowest impact

Alternative fuels options for mobility

- If either CO_2 or support of the rural economy is the main driver then
  - **Biofuels the only alternative option**
- If the implementation should be within few years (quotas!)
  - **The use of existing powertrain and infrastructure is a precondition**
- What we have up to now is Ethanol and FAME
  - **Quality issues, sustainability issues, food/fuel discussions**

Alternative fuels options for mobility



Status Alternative Fuels – Nice Products

OMV Status quo

FAME and Ethanol is used as a blending component (direct and ETBE) where it's mandatory or economic, but OMV has decided not to invest into FAME and Ethanol production because of:

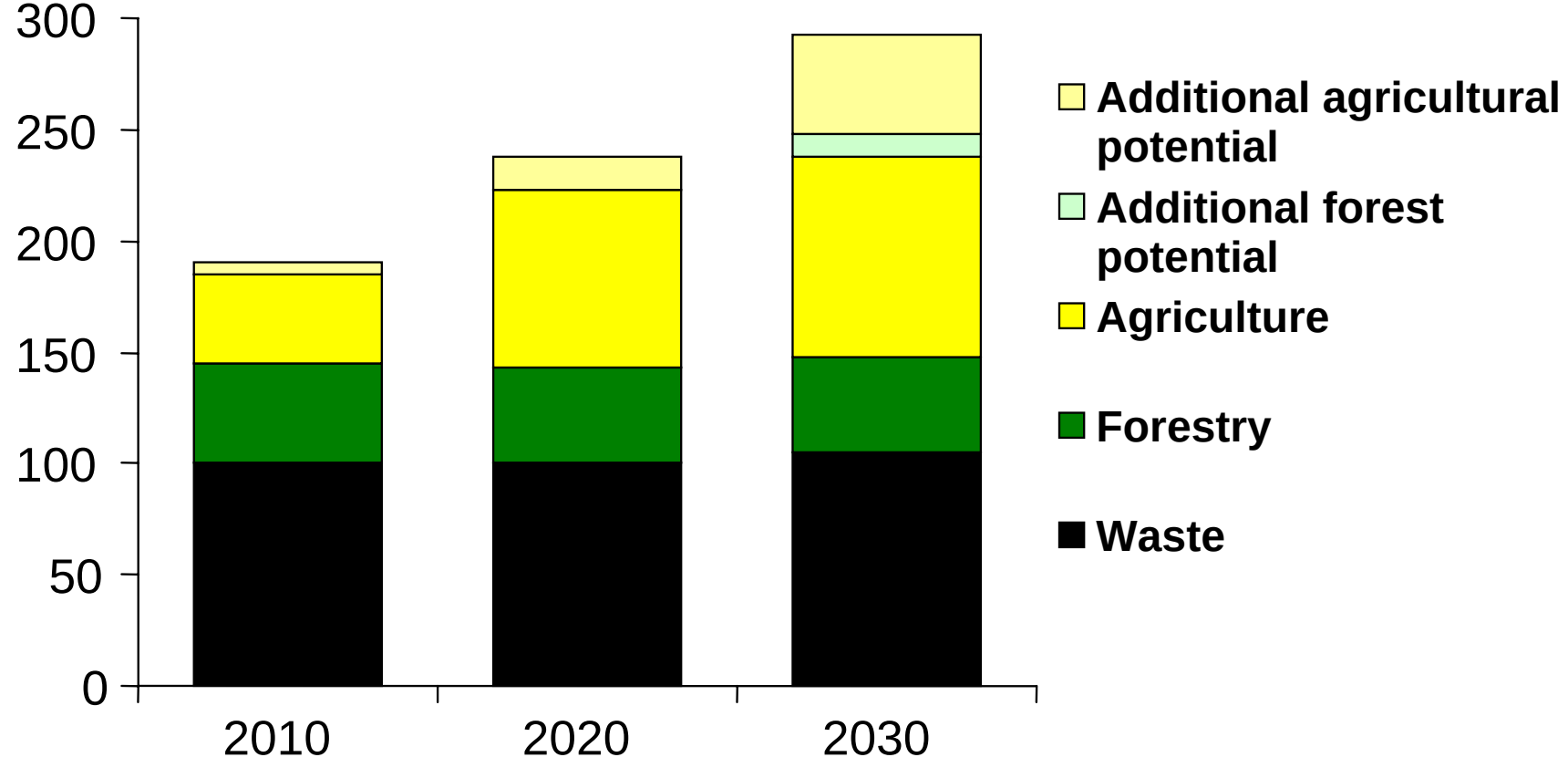
- Strong dependence on agriculture and food markets
- High political uncertainties
- A lot of investments of unrelated (to fuels) companies in this area
- Worse energy efficiency
- Worse sustainability (but rules still unclear)
- Quality issues

OMV's Assessment Criteria for Alternative Fuels

- **Product Quality**
  - Same or better than conventional fuels,
- **Business Volume**
  - Use in existing infrastructure/powertrain, fit to existing standards, use in other segments,
- **Contribution to existing quotas**
- **Energy Security**
  - Diversification of Supply (Feedstock, Region, etc.),
  - Efficiency
- **Sustainability**
  - Economic (mid and long term)
  - Social aspects
  - Environmental aspects

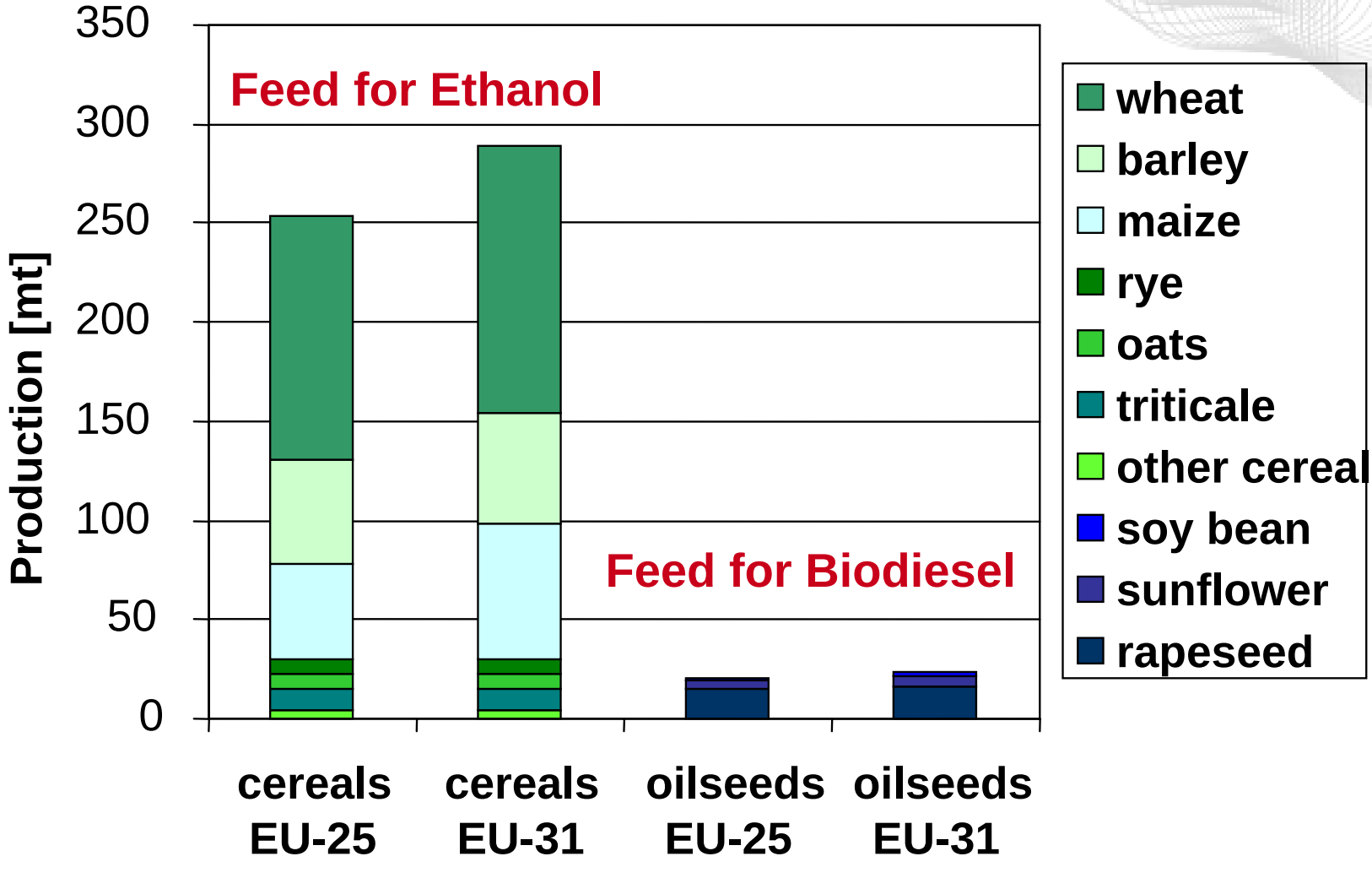
Biomass is a limited resource

EU - Environmental compatible primary bioenergy potential [mtOE]



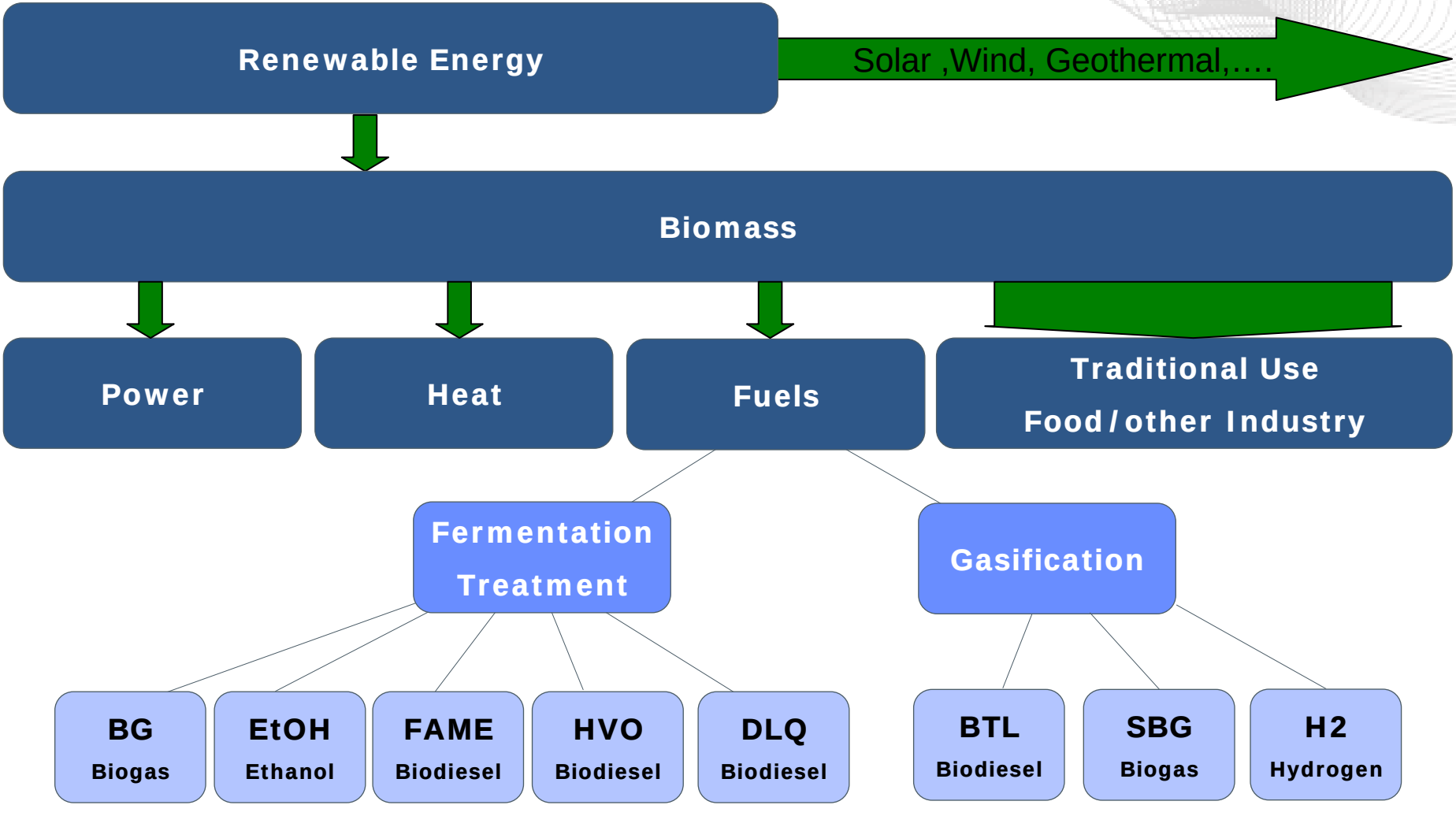
Source: EEA Report, No 7/2006

Production of Cereals and Oilseeds 2005



Source: agrarmarkt austria, facts & figures

Biomass - competitive use



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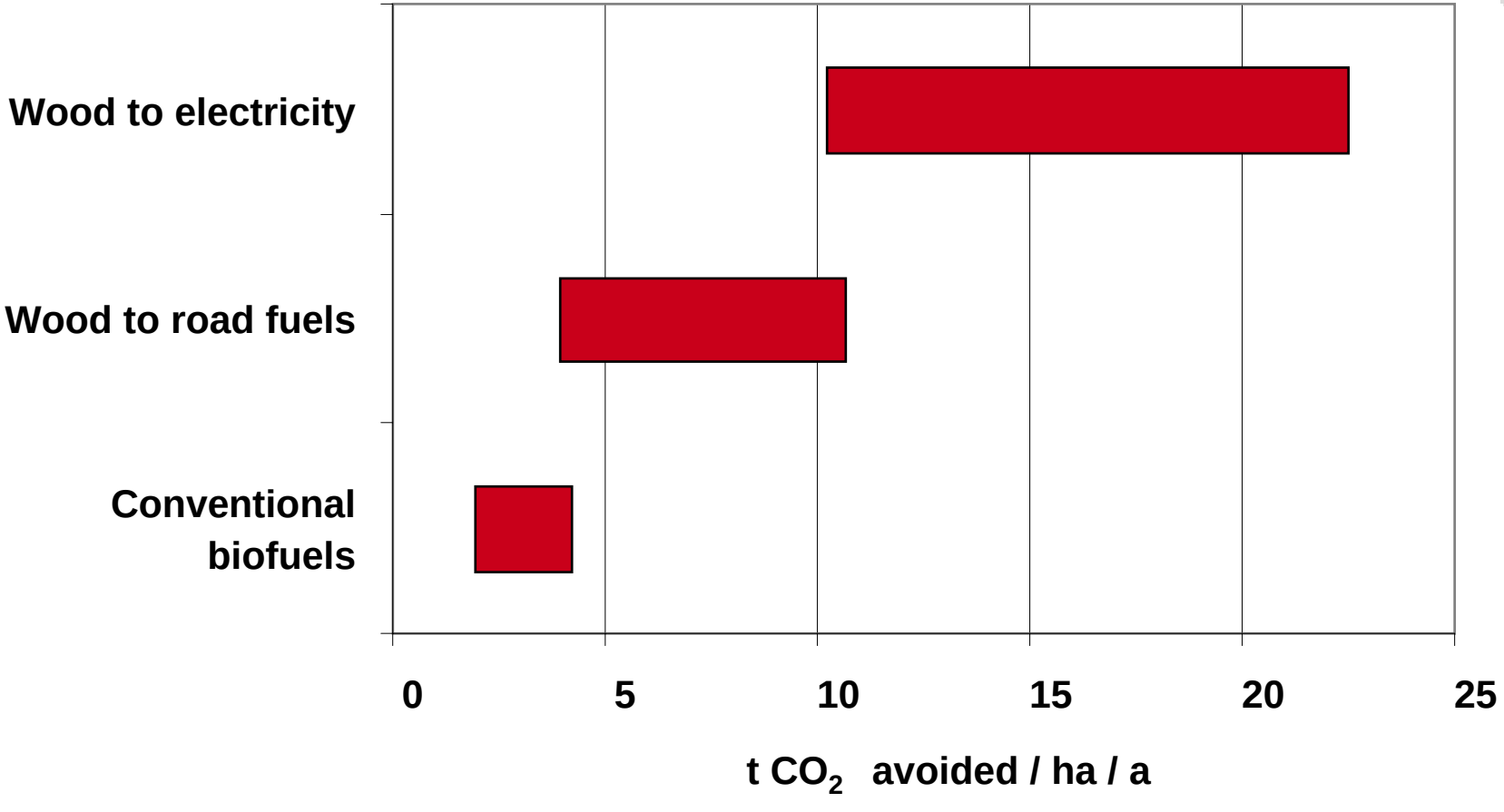
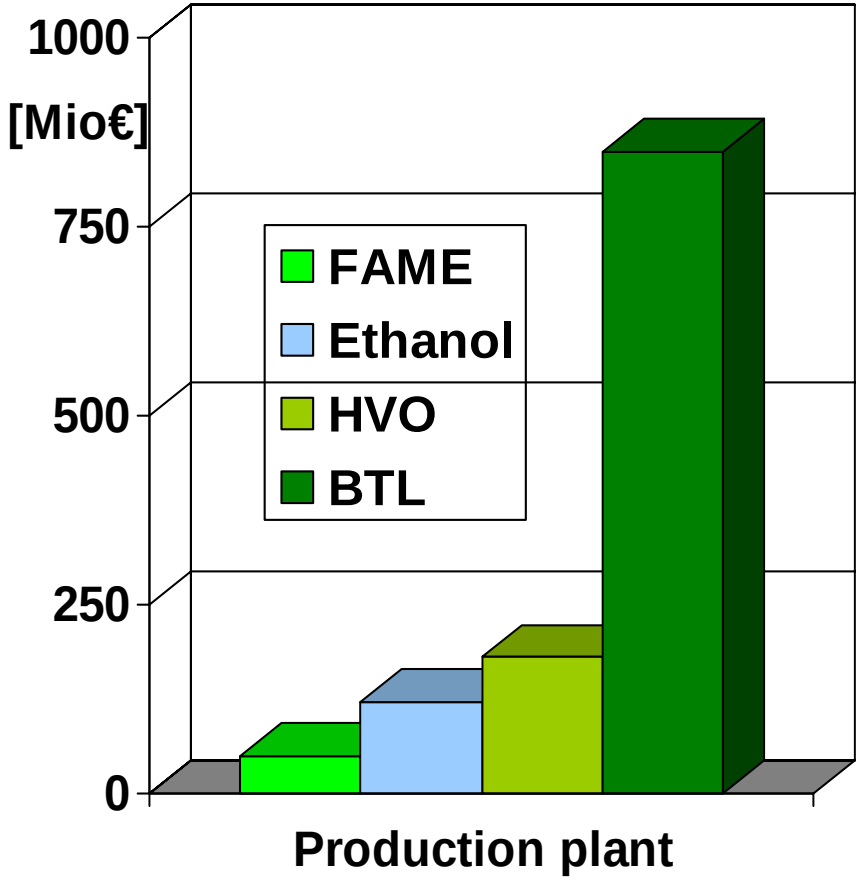
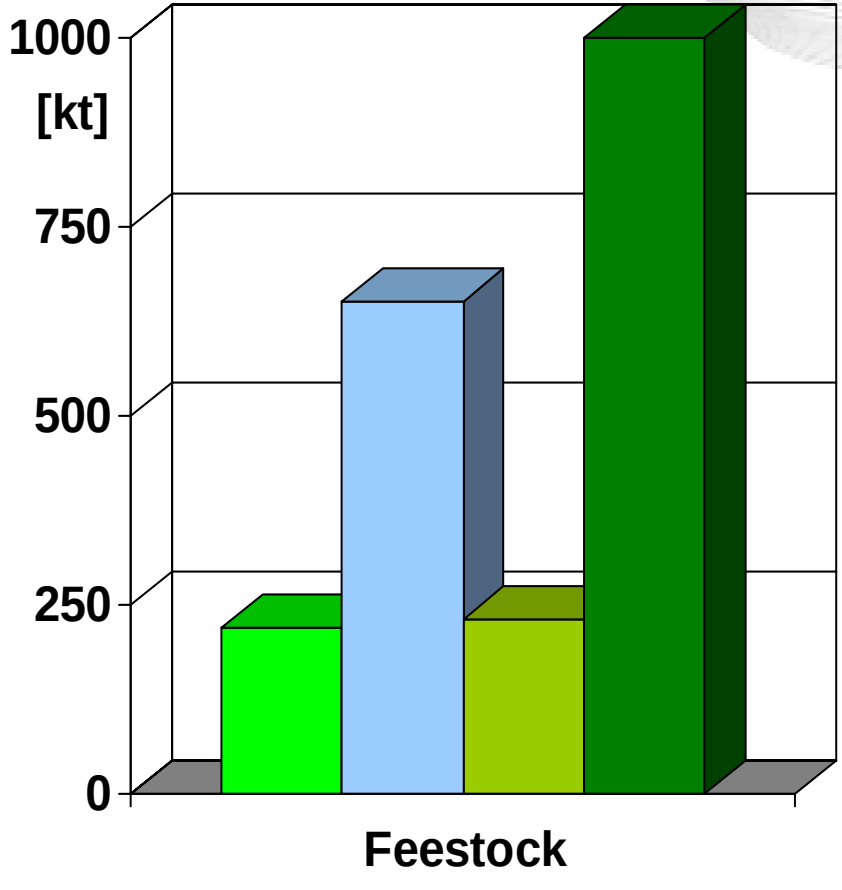
Biomass saves more CO_2 in stationary applications



Source: JEC WTW 2007

Investment into 200.000 t/y production





Why HVO?

- Feed is a high concentrated biomass
- Wide range of different feeds possible
- Large catchments area
- Centralized Unit with good integration into refineries
- Transportation in rail/ship cargos

- Technology fits to refineries
- Renewable diesel fuel without technical restrictions at reasonable costs
- Fulfills assessment criteria for alternative fuels

Summary

- Future CO_2 Legislation will tighten the diesel:gasoline ratio
- European agriculture produce up to now feedstock for gasoline substitution and only a small amount of oil seeds for diesel substitution,
- Strong competition on biomass for energy use between sectors
- Conversion of cellulosic materials to diesel is not available in the next years and use in other segments is more efficient

Summary

- **What we need**:
  - Substitutes for diesel fuel!
  - Change in EU agriculture or more openess for imports?
  - Intensified development of biomass (waste) process technology
  - Introduce a pan-European biofuels sustainability / GHG certification scheme
  - Sustainable Legal Framework (serious investment conditions)
  - …….

In Future: Integrated Biorefineries?

Thank You for Your attention!

Dr. techn. Dipl.-Ing. Walter Böhme MSc, MBA

OMV Aktiengesellschaft
Innovation Management
Otto Wagner Platz 5
1090 Vienna

Telefon +43 (1) 40440-21956
Telefax +43 (1) 40440-621956
Mobil +43 (664) 3518023

walter.boehme@omv.com
http://www.omv.com