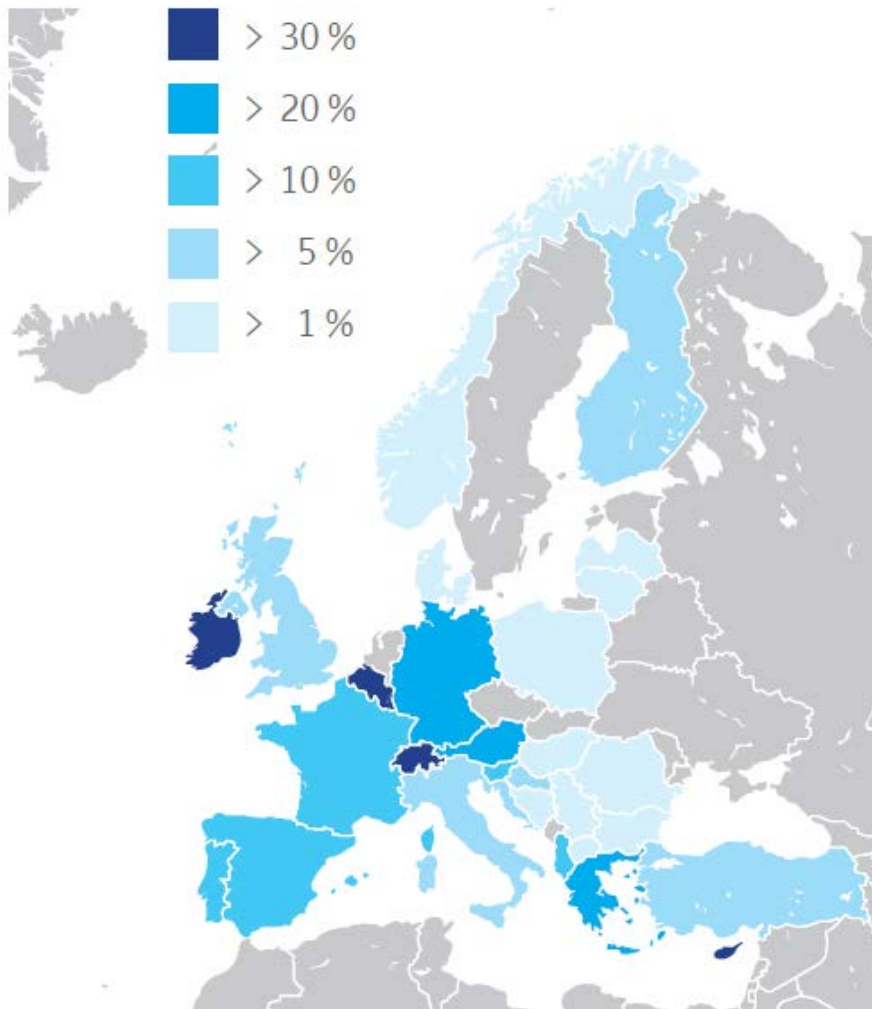




Future fuels options

Dr. Ernst-Moritz Belling



17% of European heating systems run on heating oil, representing 20,000,000 homes across the EU

Today energy is a main driver in our society



Industry,
transport &
heating

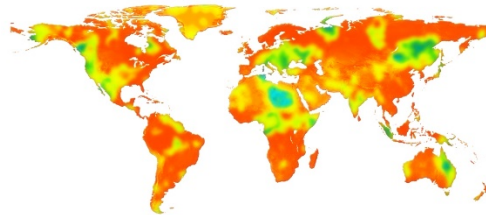
ensures

Comfort &
prosperity



Three objectives for energy policy

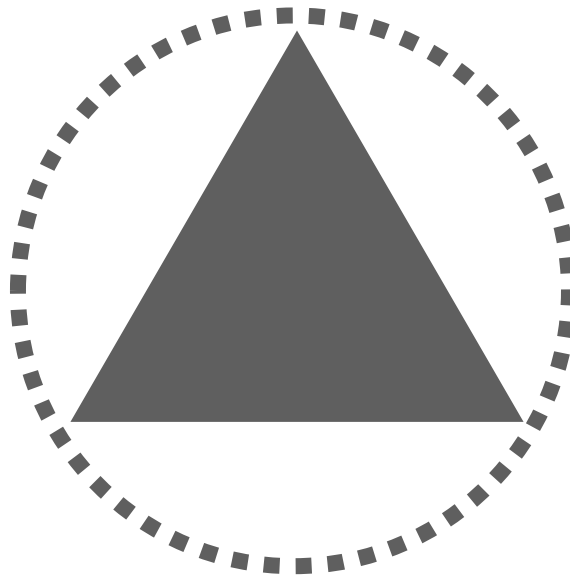
Climate protection



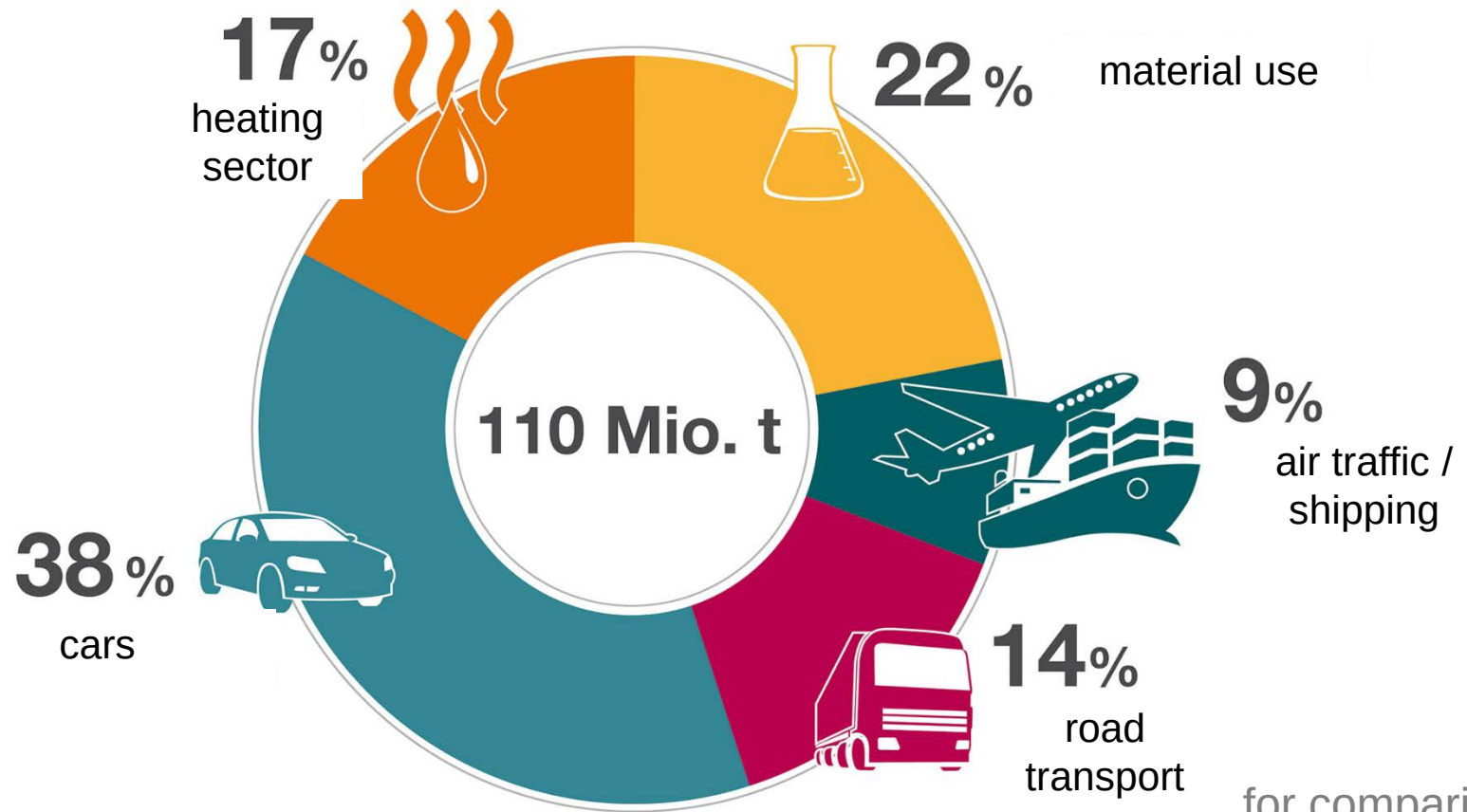
Security of supply



Economic Efficiency and Competitiveness



Importance of mineral oil – today's situation in Germany



for comparison:
USA 860 Mio. t

Source: MWV (2017): Absatz von Mineralölprodukten nach Anwendung.

Europe's climate policy challenges

- Paris Agreement 2015 – limiting man-made global warming - regulates international climate policy for 196 States, starting from 2020
- Temperature rise should be lower than 2° C
- EU's commitment to reduce GHG emissions by 2050
- EU member states have to implement European regulations

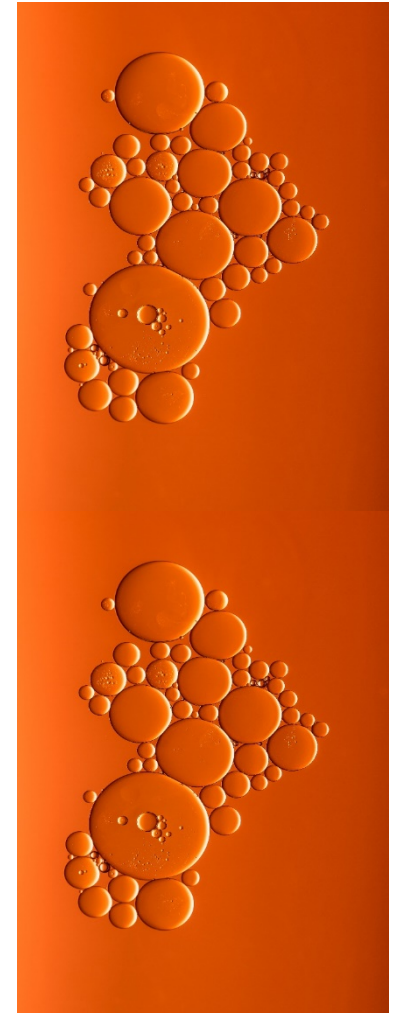


European goals for 2020, 2030 and 2050

	Greenhouse Gas Reduction	Renewable Energies	Energy Efficiency
2020 Package	- 20 % 2020 versus 1990	+ 20 % share 2020	+ 20 % energy savings versus 1990
Framework 2030	- 40 % 2030 versus 1990	+ 32 % share 2030	+ 32,5 % energy savings versus 1990
Roadmap 2050	- 80 - 95 % 2050 versus 1990	+ 93 - 99 % share 2030	-

Visible acceleration in EU-legislation relevant for heating oil

- Ecodesign / Energy Labelling
Requirements concerning the ecological design of energy driven products , e. g. minimum efficiency requirements as well as labelling of boilers
- EED (Energy Efficiency Directive)
Increase of Energy efficiency via energy audits and commitments of energy suppliers to reduce the energy consumption of their customers
- EPBD (Energy Performance of Buildings Directive)
Additional requirements for new and existing buildings
- RED II (Renewable Energy Directive)
Requirements concerning renewable energies – “which energy can be counted as renewable”
- ETD (Energy Tax Directive)
Basis of future energy tax calculations



Summary of today's Situation

- Environmental goals: CO₂ minus 80% - 95% up to 2050
- Political debate regarding CO₂ emissions and fossil fuels intensified
- NO_x debate increased
- Dieselgate – Diesel cars are under pressure
- Discussion regarding CO₂ tax started
- Heating oil bans



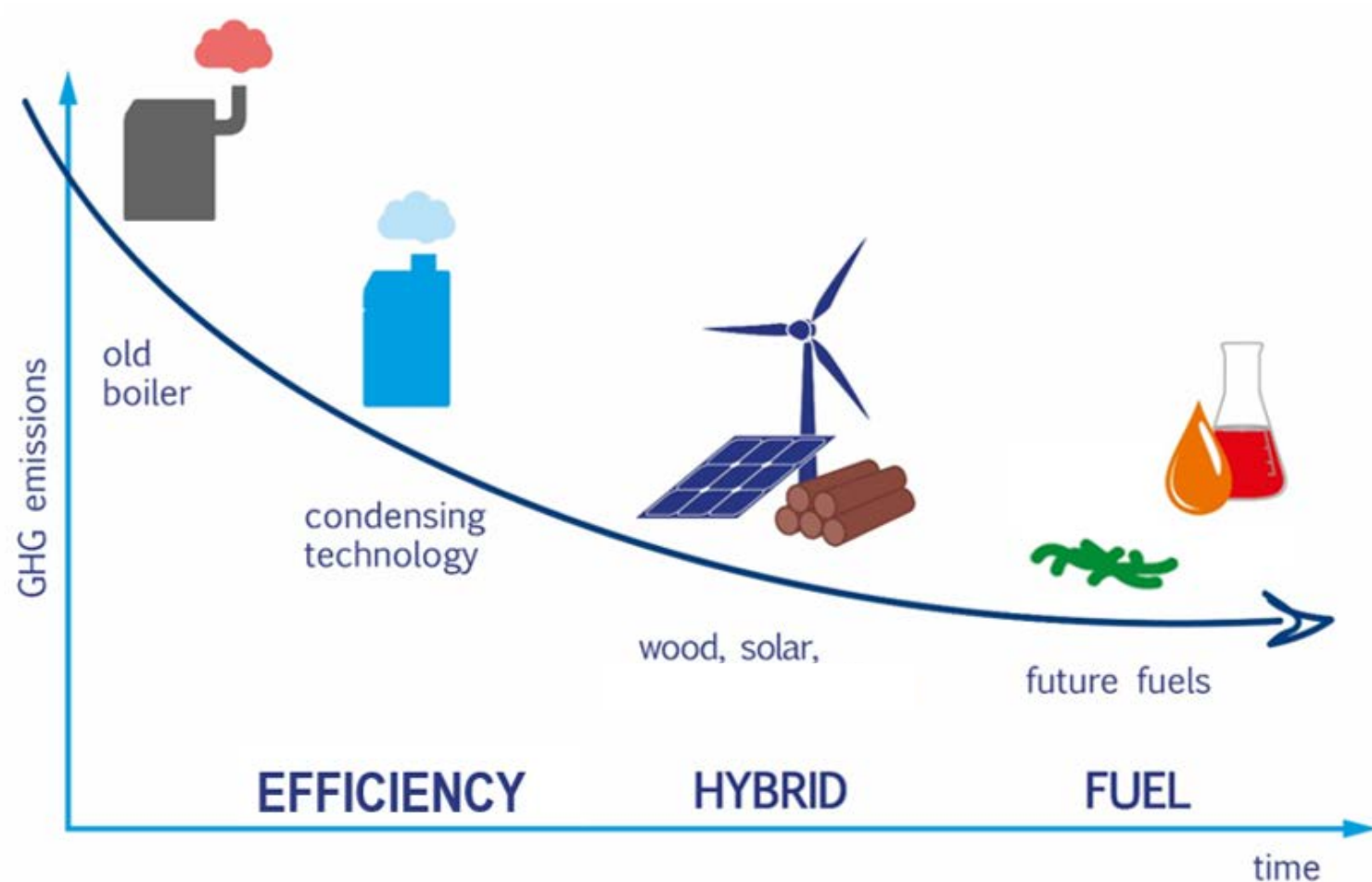
What's the perspective for heating oil?

Idea

Story



Perspective for heating oil



EUROFUEL's story „channels“

Workshops

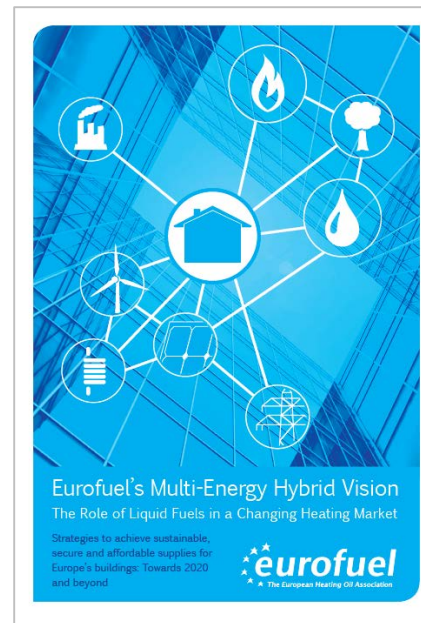


Presentations

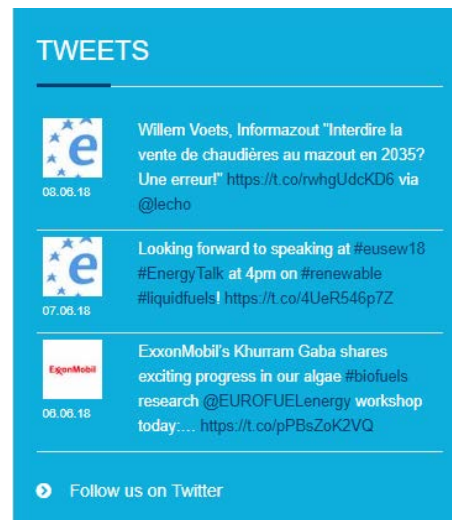


www.eurofuel.eu

Brochures



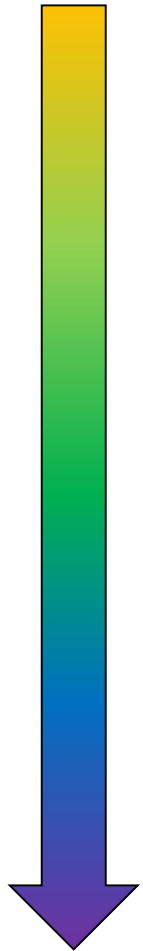
twitter.com/eurofuelenergy



Other #FutureFuels articles

- Part 1: What future liquid fuels to heat our homes?
- Part 2: New liquid fuels... out of biomass and waste?
- Part 3: New liquid fuels... out of the sunshine?
- Part 4: New liquid fuels... out of algae?

Development status and perspectives of future liquid fuels



Bioenergy-based products (Biodiesel (FAME))

Not sufficient to cover evolving demand; competition in usage

Hydrogenation of natural oils and fats/waste fats (HVO)

State of the art; potential for immediate GHG emission reductions, biomass without use of crop plants

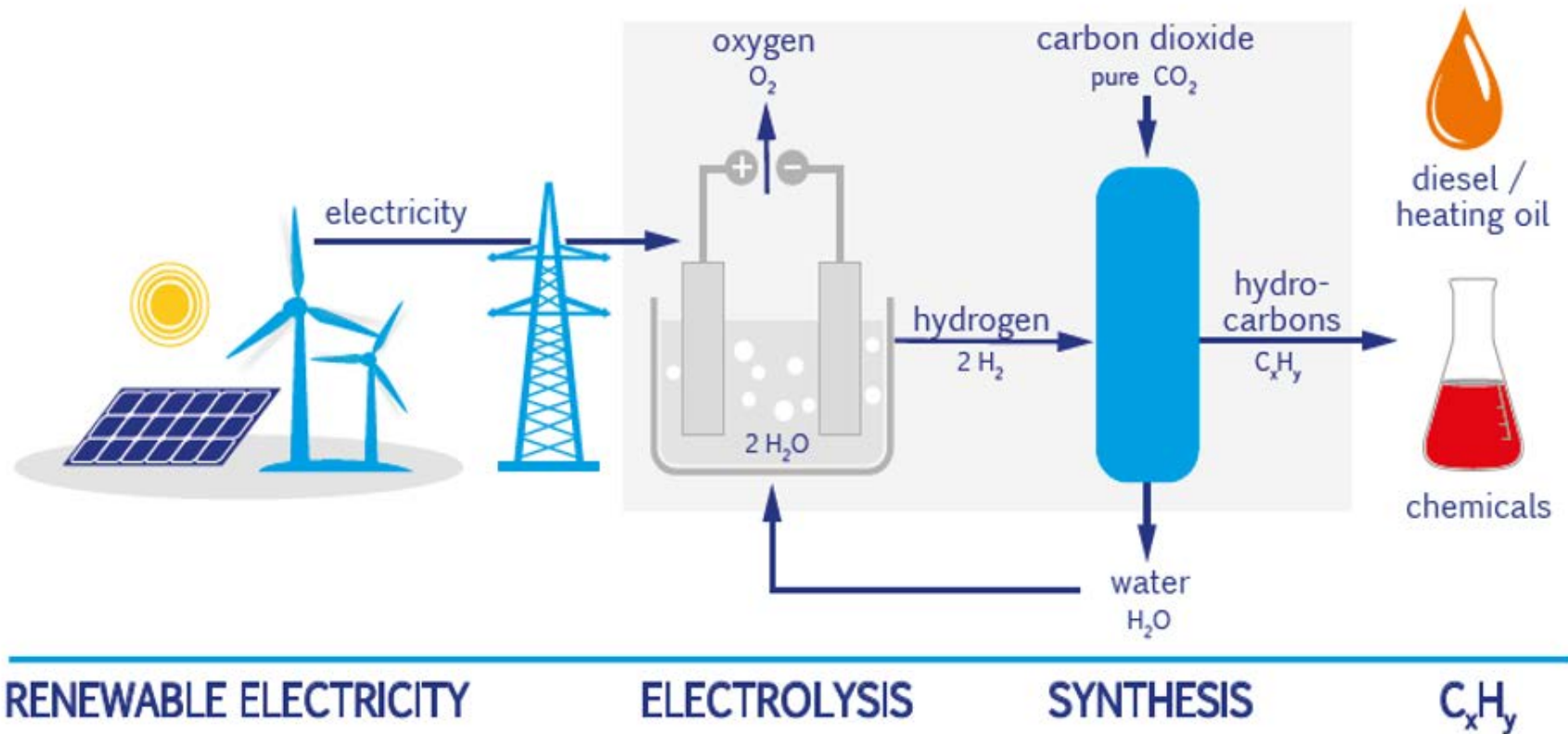
Biomass to Liquid (BtL)

Demonstration plants available already

Power to Liquid (PtL)

Good perspectives for future energy production

The “Fischer-Tropsch” synthesis

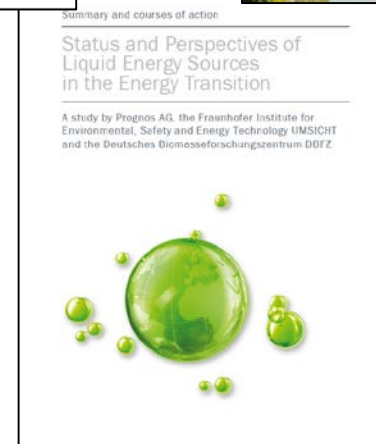
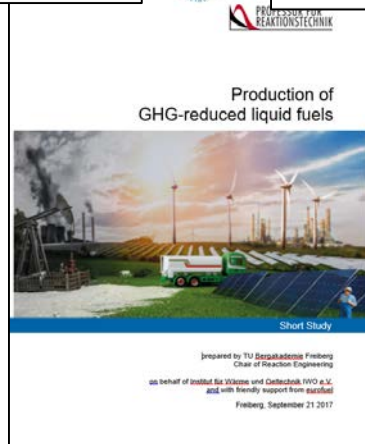
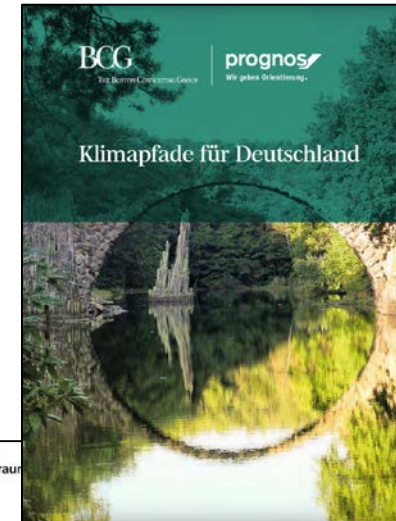


Production of E-Fuels

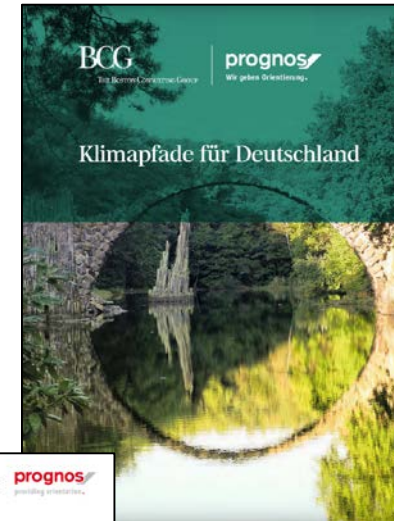
- Low electricity prices are essential
- Advantage for countries with lots of sun and wind
- Advantage for countries with an existing oil- and gas infrastructure



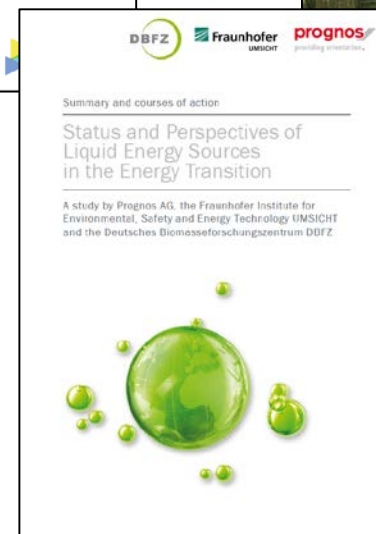
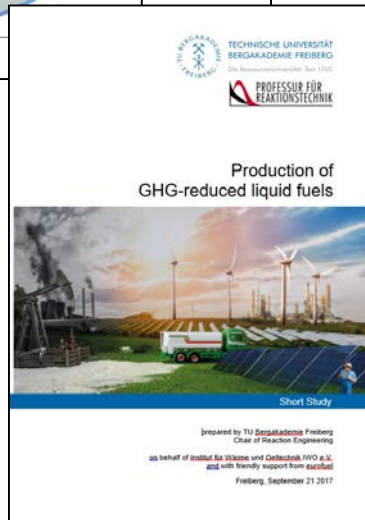
Recent studies regarding renewable fuels



Recent studies regarding renewable fuels



Available on
Eurofuel's
website

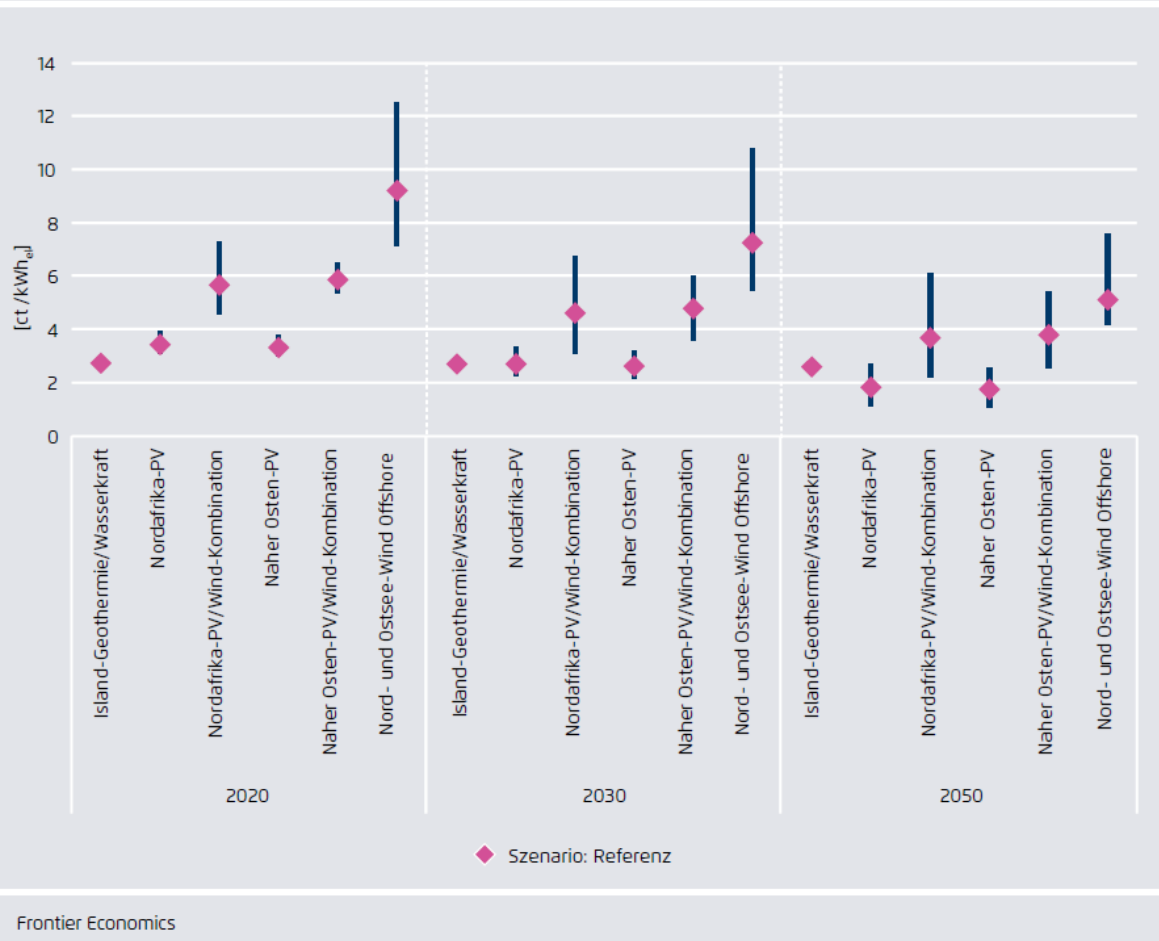


Available on
Eurofuels's
website

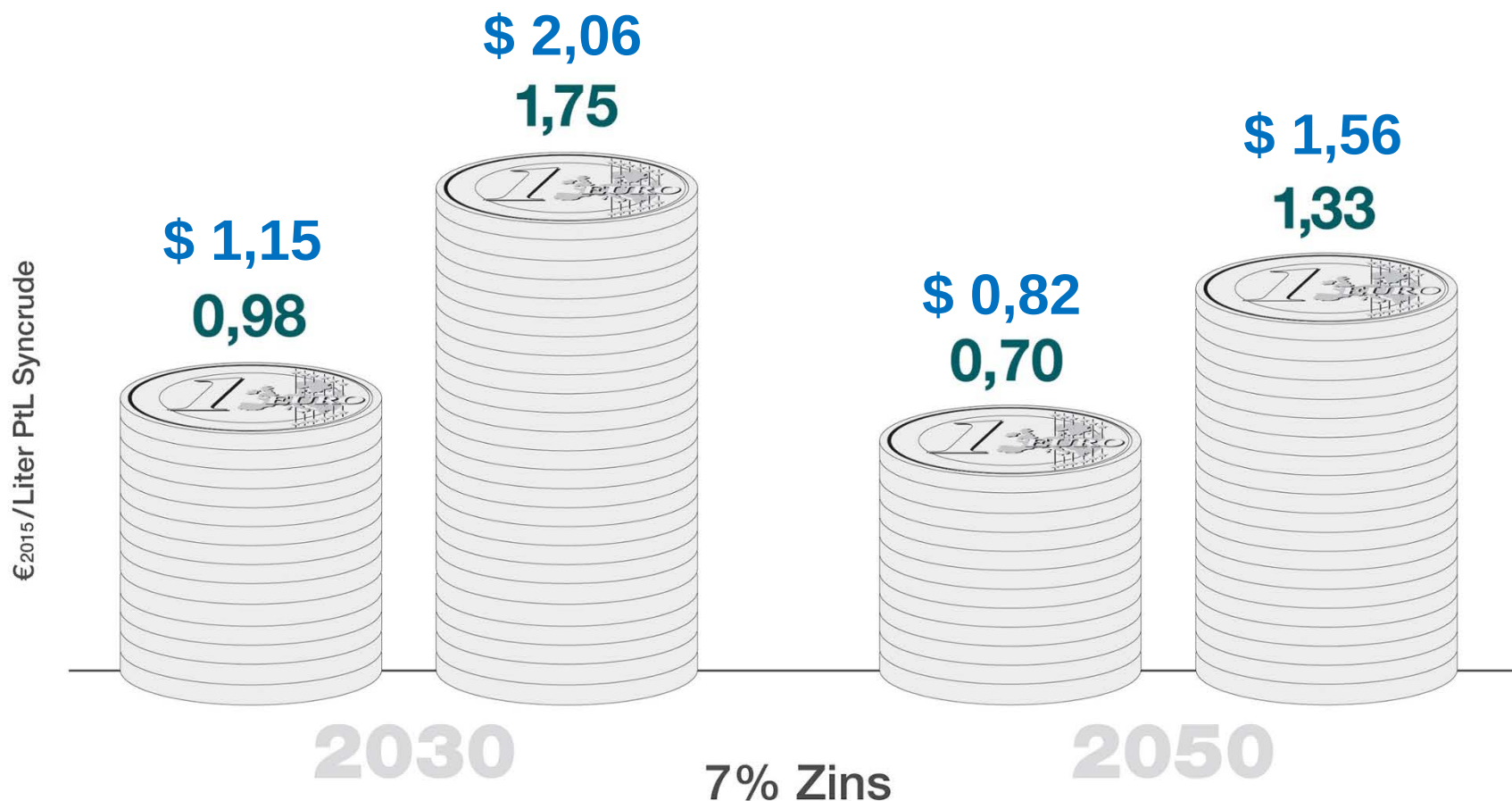
Electricity prices for production

Stromgestehungskosten in den Jahren 2020, 2030 und 2050 [$\text{ct}_{2017}/\text{kWh}_{\text{el}}$]

Abbildung 7



PtL prices in future



Quelle: Prognos/DBFZ/UMSICHT (2018): Status und Perspektiven flüssiger Energieträger in der Energiewende.

- Substantial changes are required in energy use in all sectors
- Europe imports much of its energy, self-sufficiency is not realistic
- Energy efficiency is an important first step, but not sufficient
- Renewable electricity will play a major role, but full electrification is unrealistic
- A mix of energy sources will best fit to a sustainable, secure and cost-effective energy supply
- Liquid energy will be needed in future
- Industry research in reducing carbon content of fuels is needed



Future already started



A few examples - Bastorf



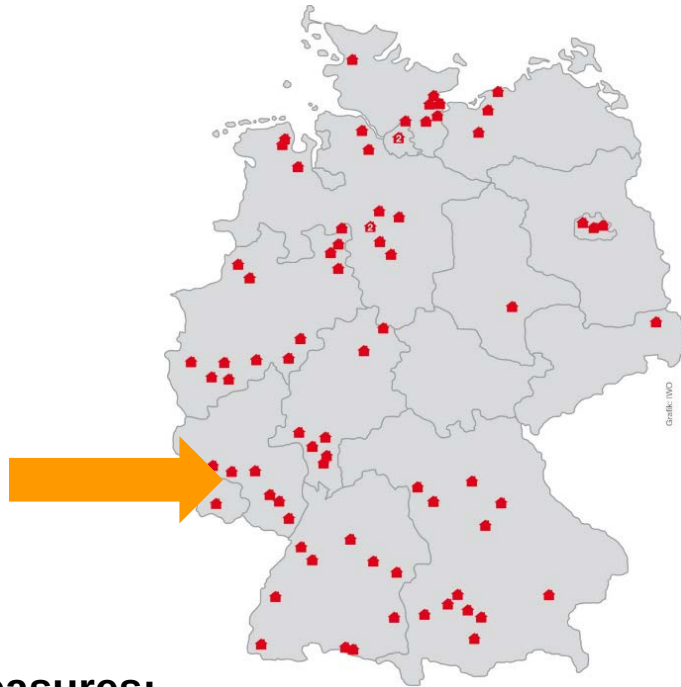
A few examples - Bastorf



Measures:

- Modernisation of heating system
- Insulation
- 30% share of HVO in fuel
- CO₂ emissions reduced by 80 %

A few examples - Baumholder



Measures:

- Modernisation of heating system
- Insulation
- 50% share of HVO in fuel

→ CO₂ emissions reduced by 89 %



Potential for future liquid fuels

- Use of today's technologies and supply chain
- Step-by-step integration of renewable liquid fuels (drop-in possibility)
- Easy transport and storage
- Cost-efficient solution for modernisation of existing buildings
- Liquid fuels provide a robust scenario – can even compensate failure of modernisation or electrification targets
- Ideal combination with fluctuating renewable energies



Renewable liquid fuels



Renewable liquid fuels
are essential and
- part of the solution



Future fuels options