Shell LPG-Studie

Flüssiggas als Energieträger und Kraftstoff
Fakten, Trends und Perspektiven

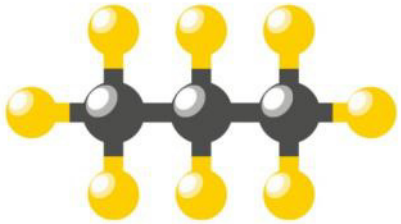
Shell Deutschland
Hamburg, Mai 2015

ÜBERBLICK SHELL LPG-STUDIE

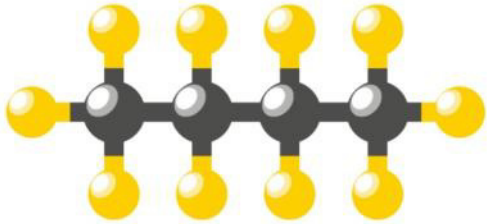
- Was ist Flüssiggas?
- LPG: Herkunft und Märkte
- LPG-Anwendungen
- Autogas - welche Vorteile?
- Autogas-Szenaretten
- Ausblick

WAS IST FLÜSSIGGAS?

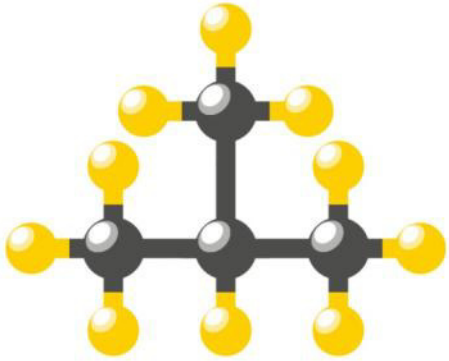
PROPAN C_3H_8
SIEDEPUNKT –42.1 °C



n-BUTAN C_4H_{10}
SIEDEPUNKT –0.5 °C

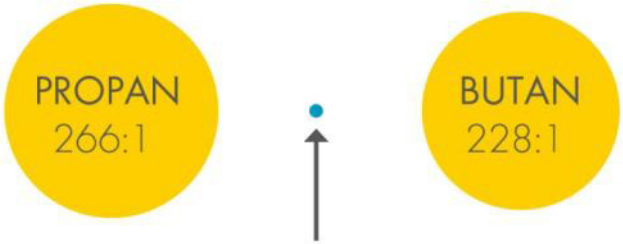


iso-BUTAN C_4H_{10}
SIEDEPUNKT –12,8 °C



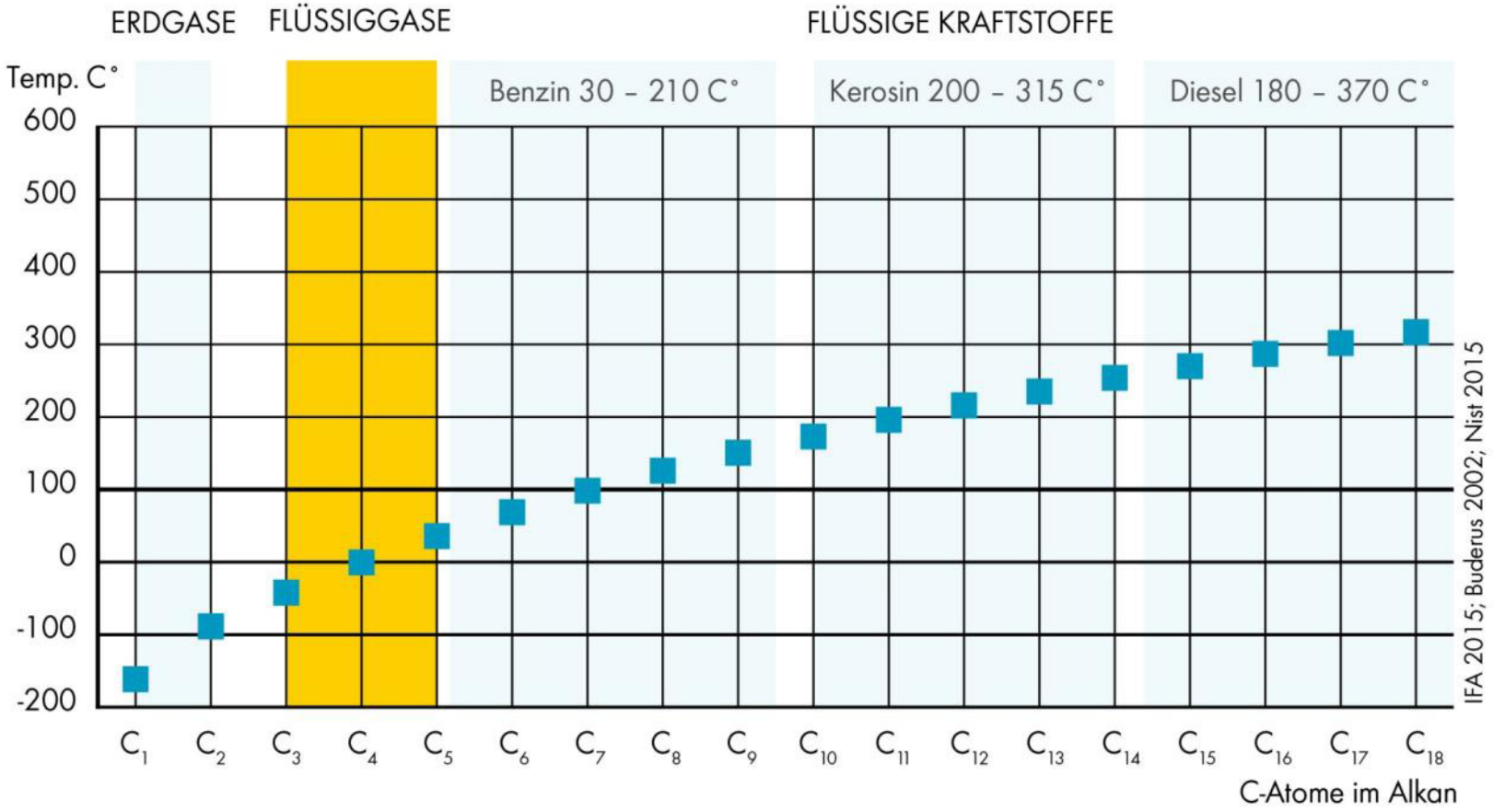
VERDICHTUNG DES VOLUMENS DURCH VERFLÜSSIGUNG

Volumen im gasförmigen Zustand

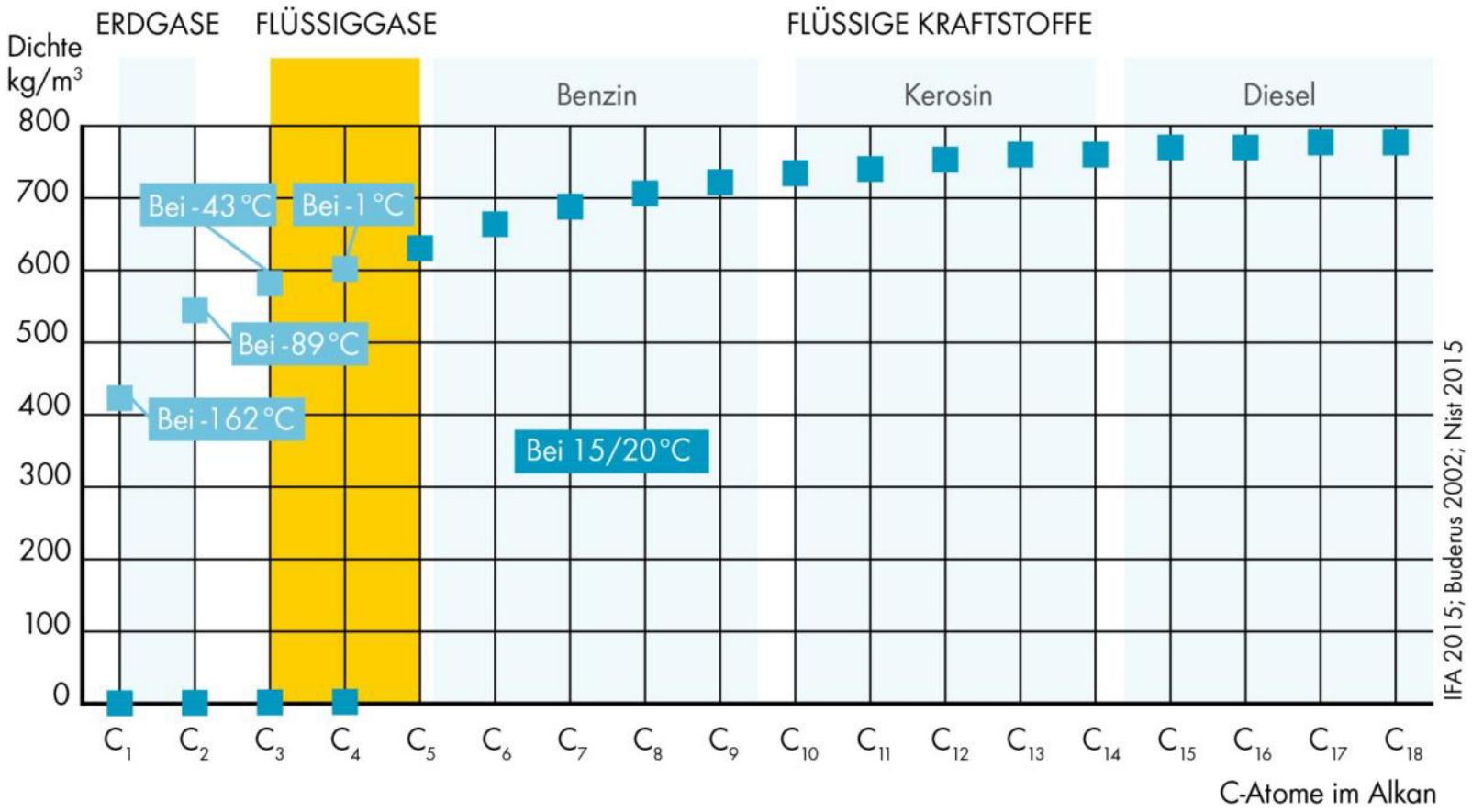


Volumen der beiden Gase im flüssigen Zustand

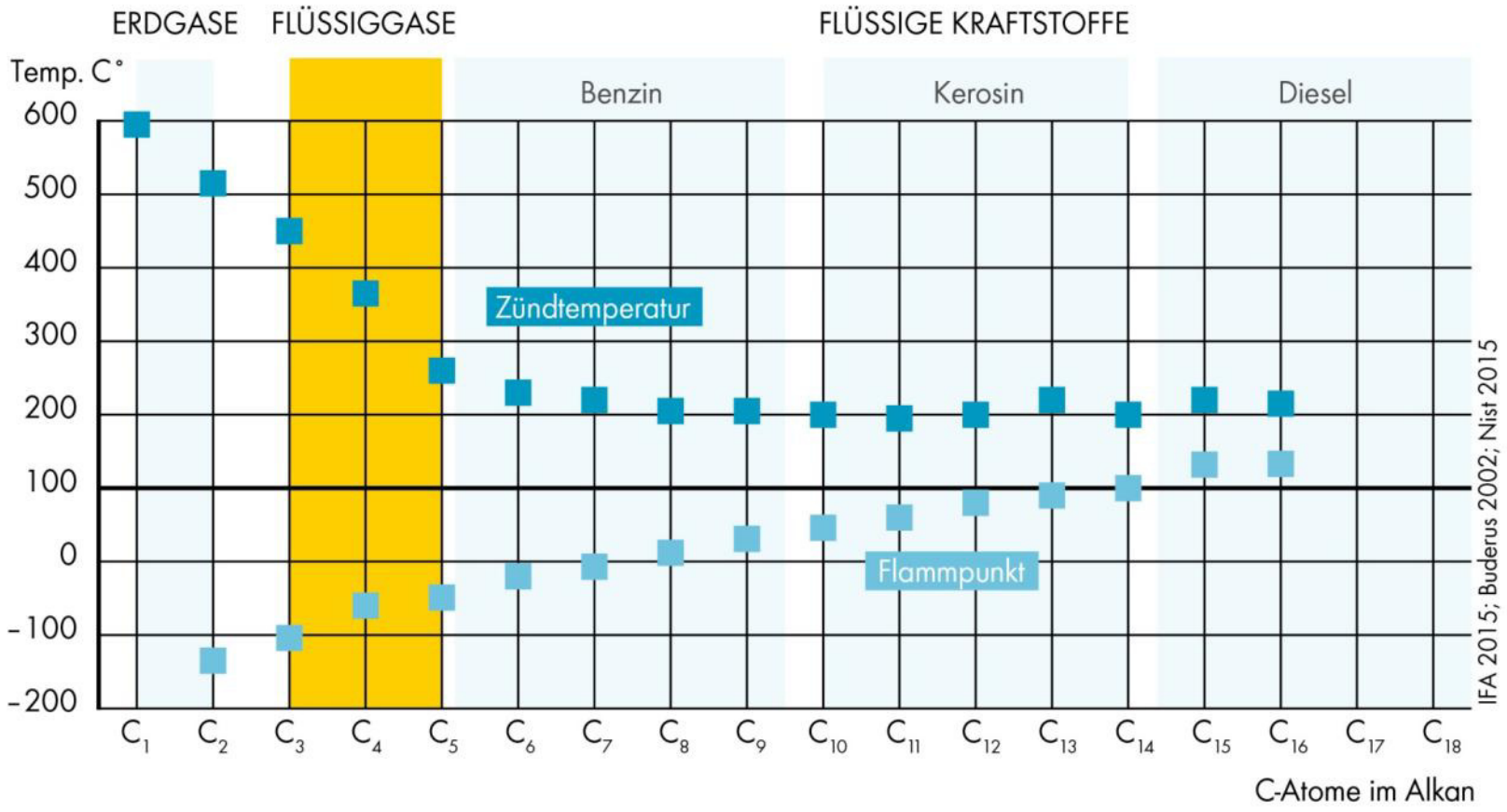
FLÜSSIGGASE - SIEDE“PUNKTE“



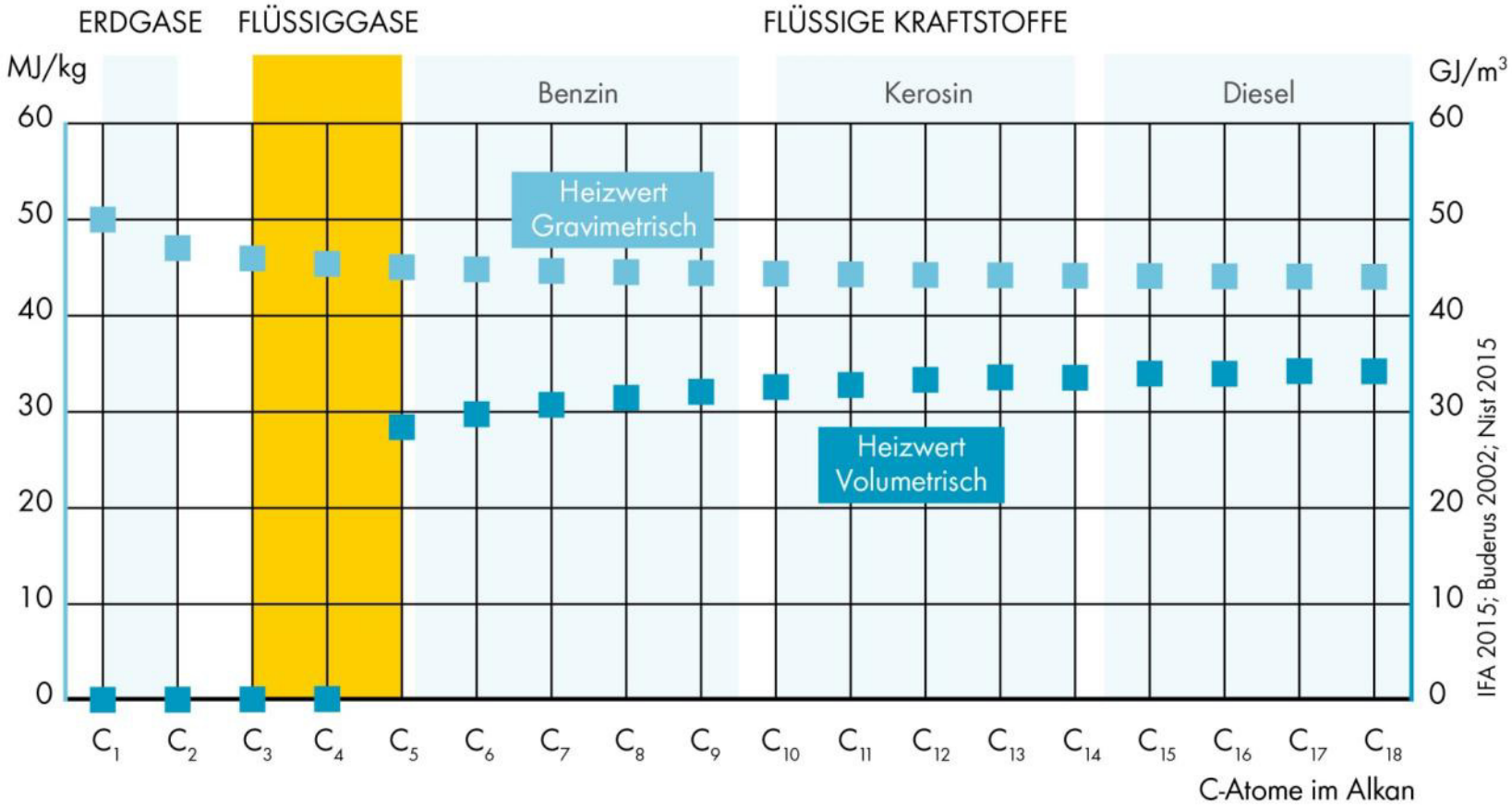
FLÜSSIGGASE – DICHTE GASFÖRMIG/FLÜSSIG



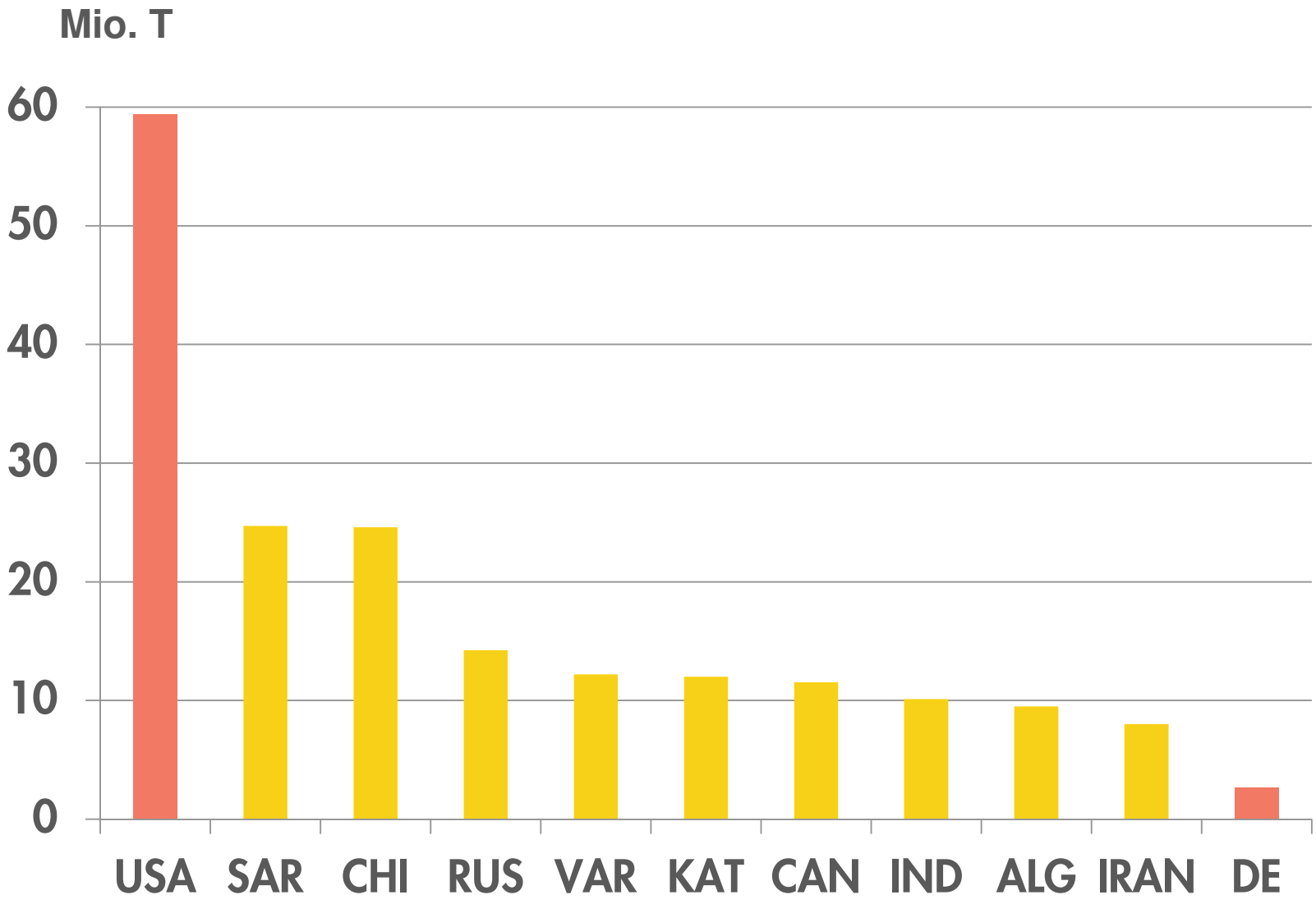
FLÜSSIGGASE – FLAMMPUNKT/ZÜNDTEMPERATUR



FLÜSSIGGASE - HEIZWERTE

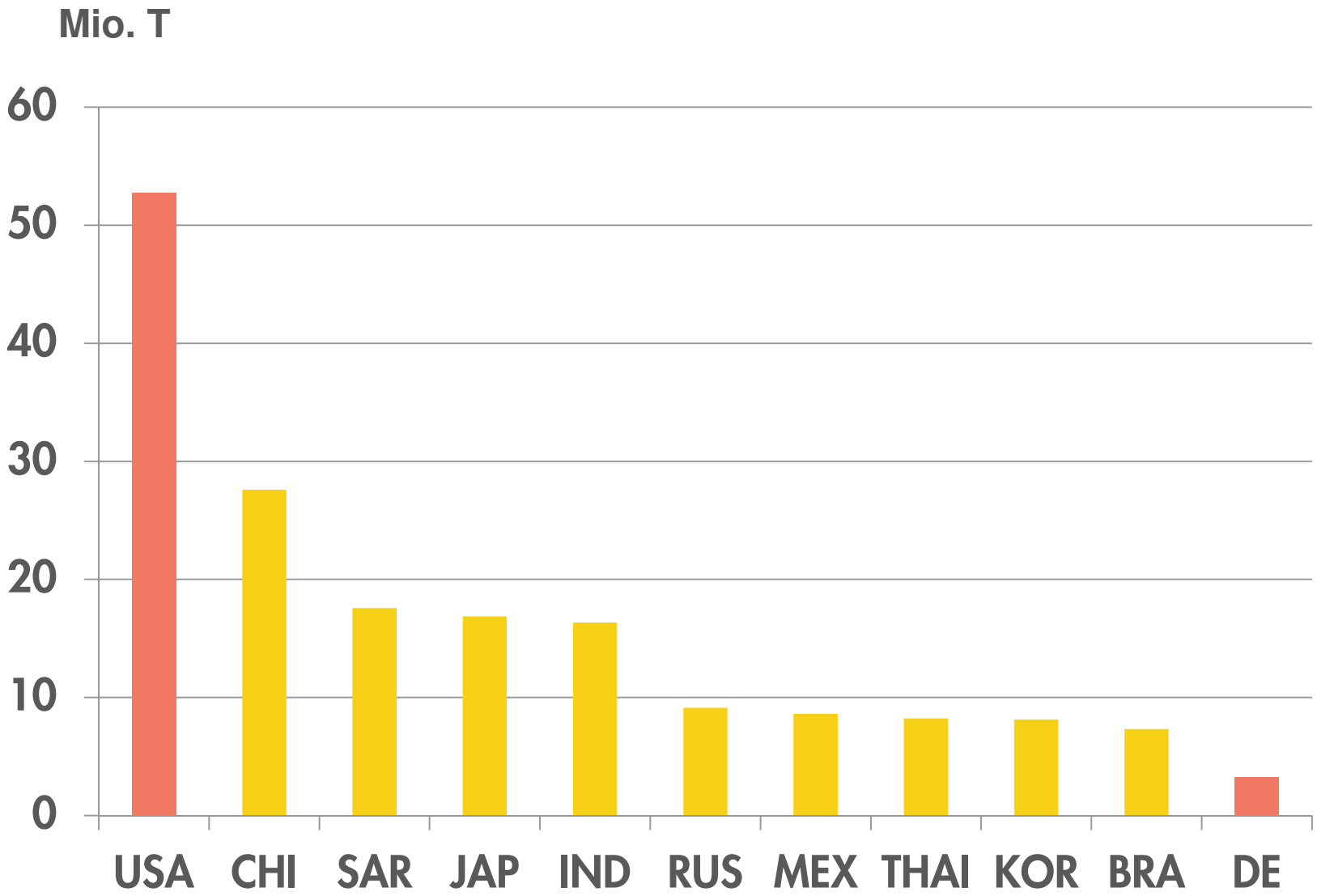


DIE GRÖSSTEN LPG-PRODUZENTEN



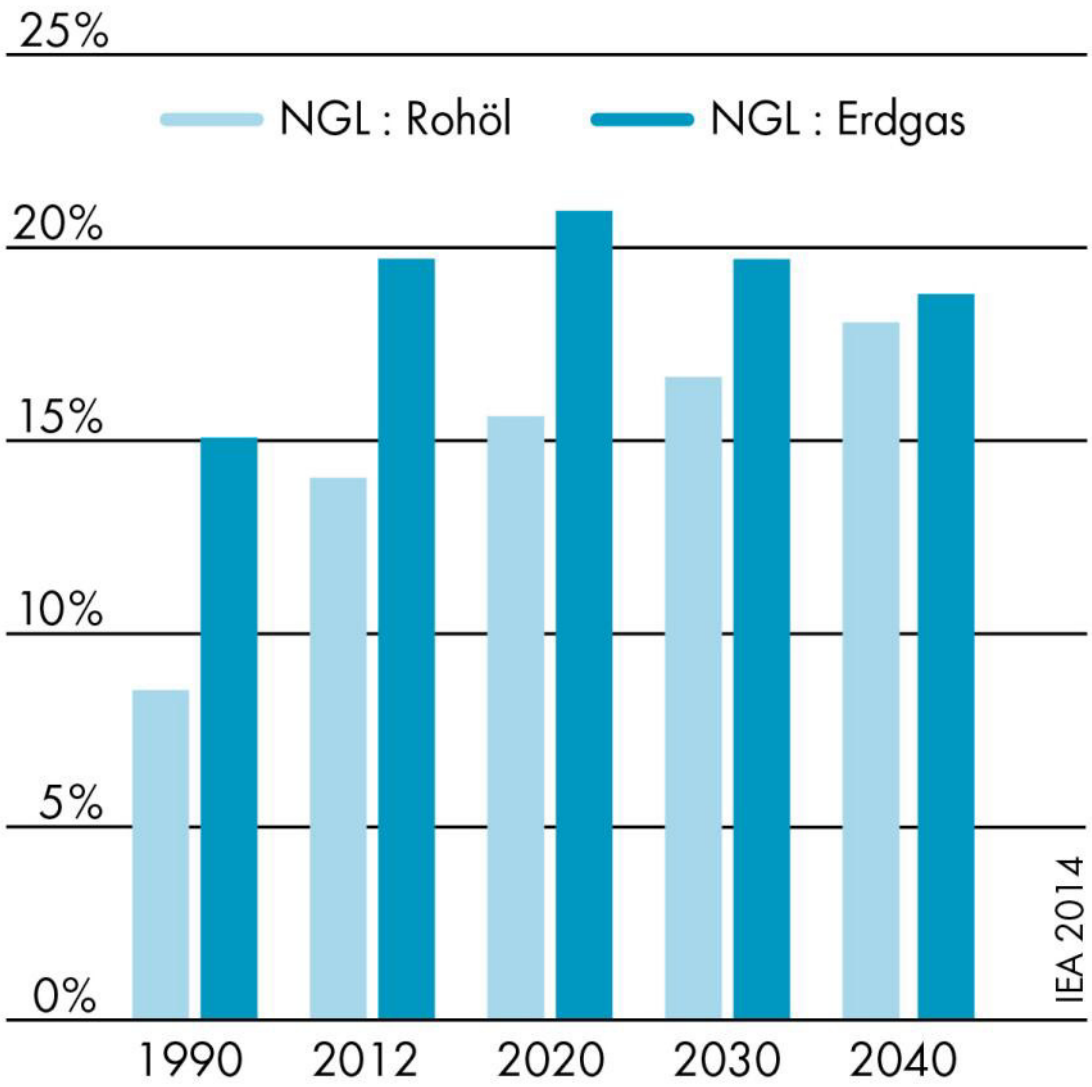
WLPGA/Argus 2014

DIE GRÖSSTEN LPG-KONSUMENTEN

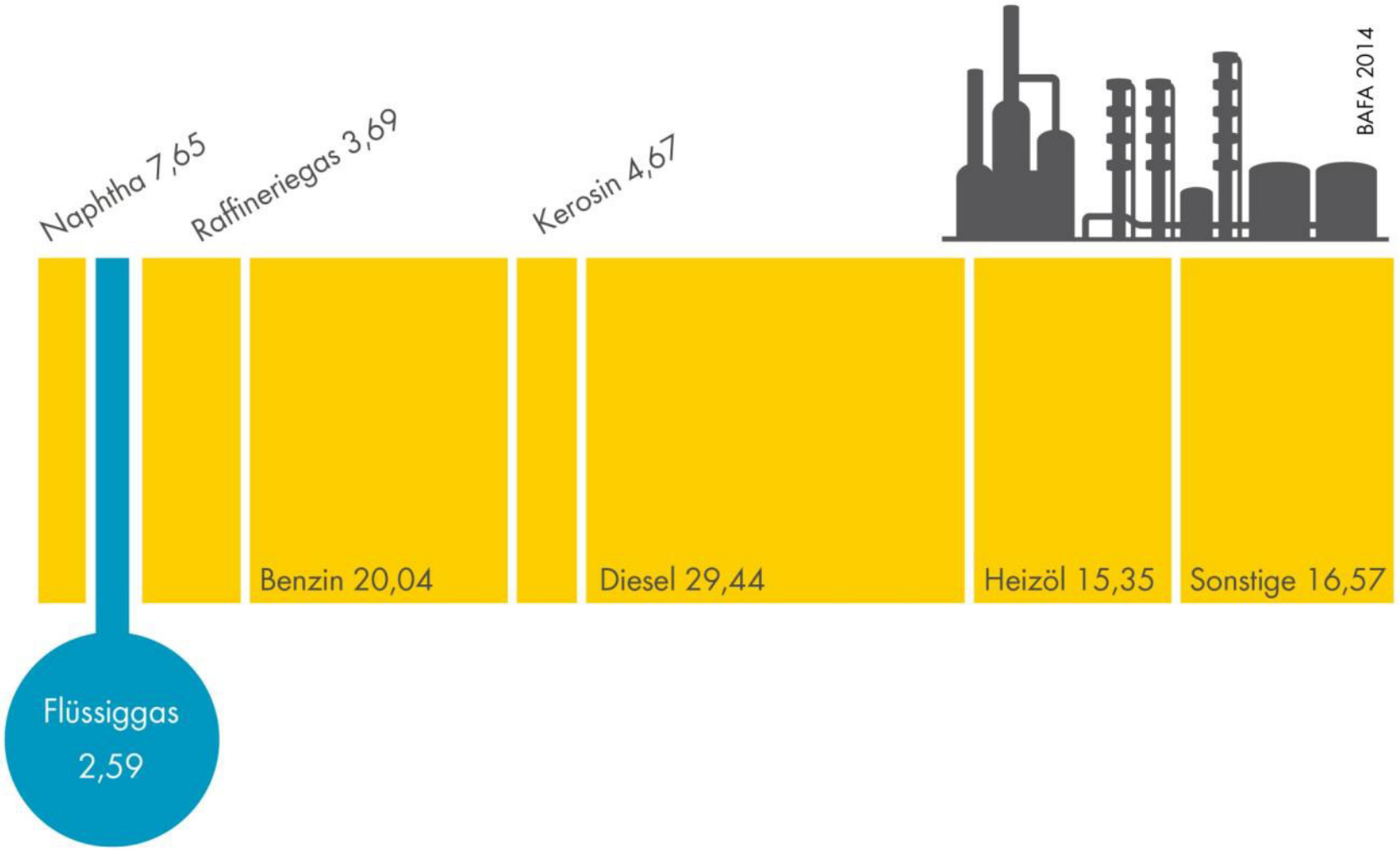


WLPGA/Argus 2014

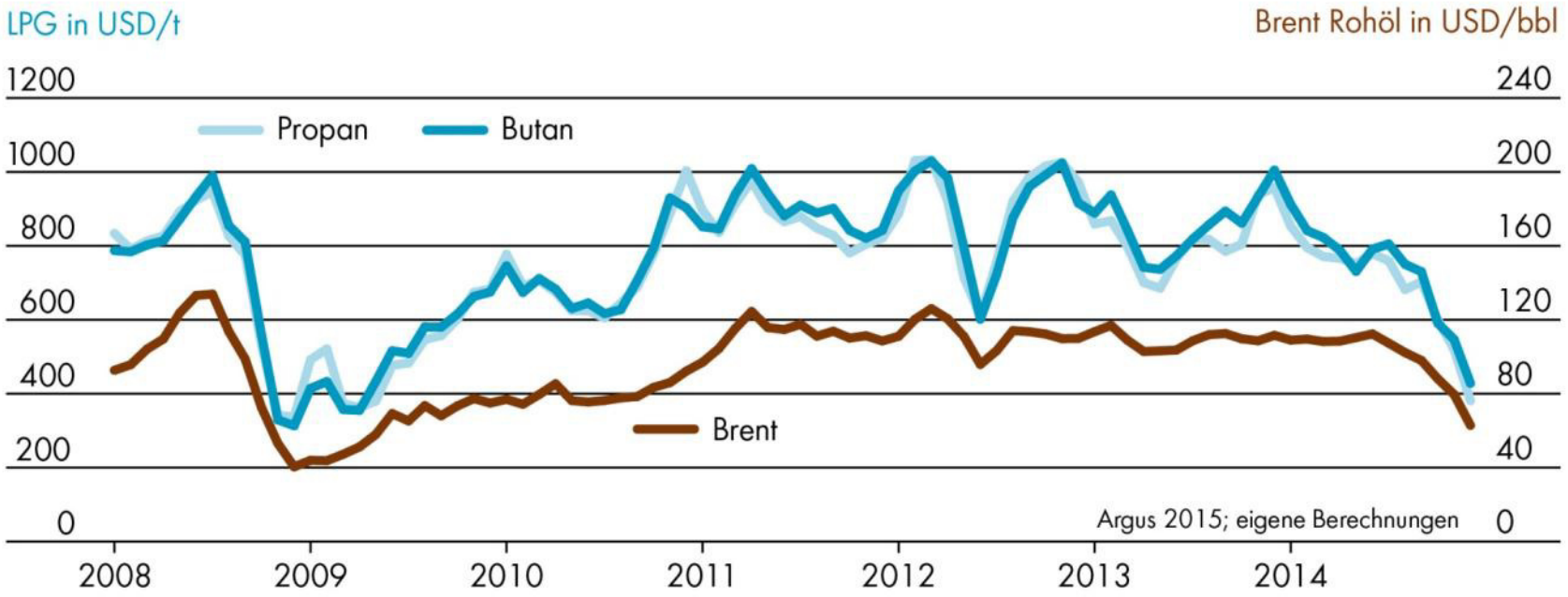
LPG-HERKUNFT: UPSTREAM



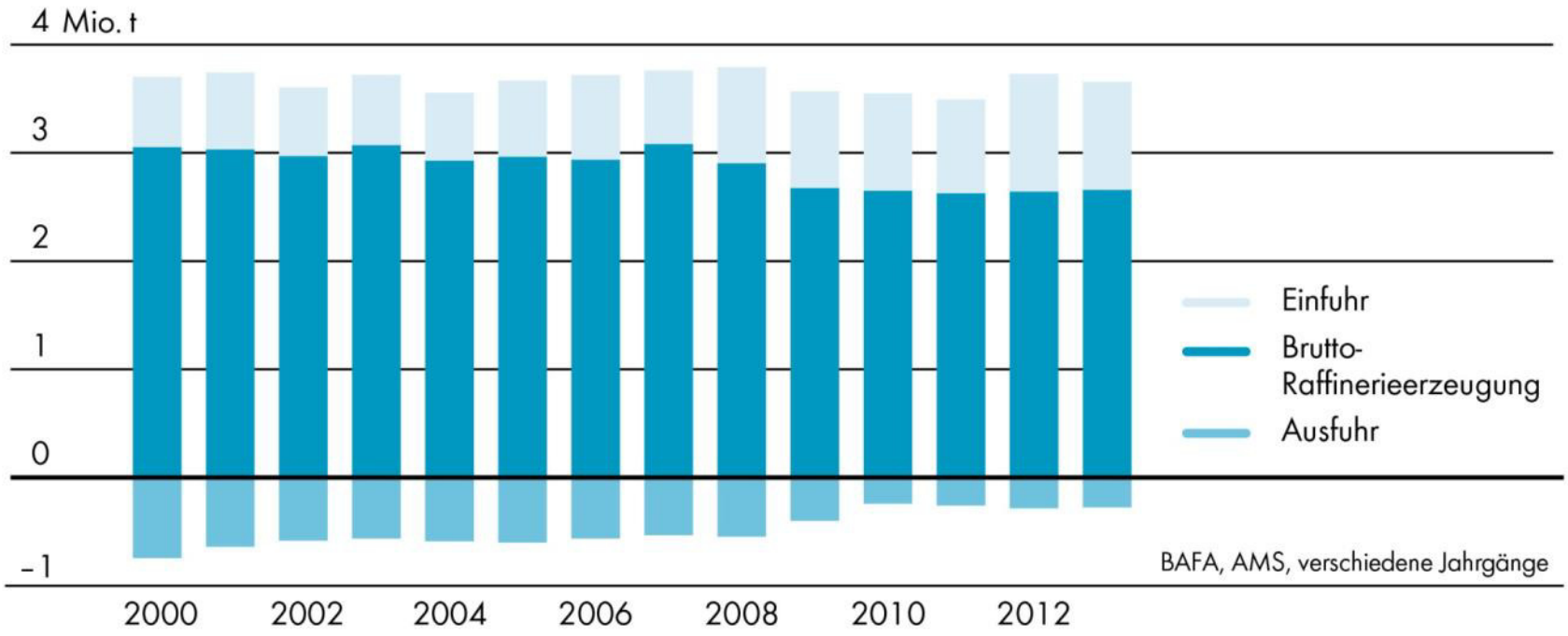
LPG-HERKUNFT – DOWNSTREAM (D)



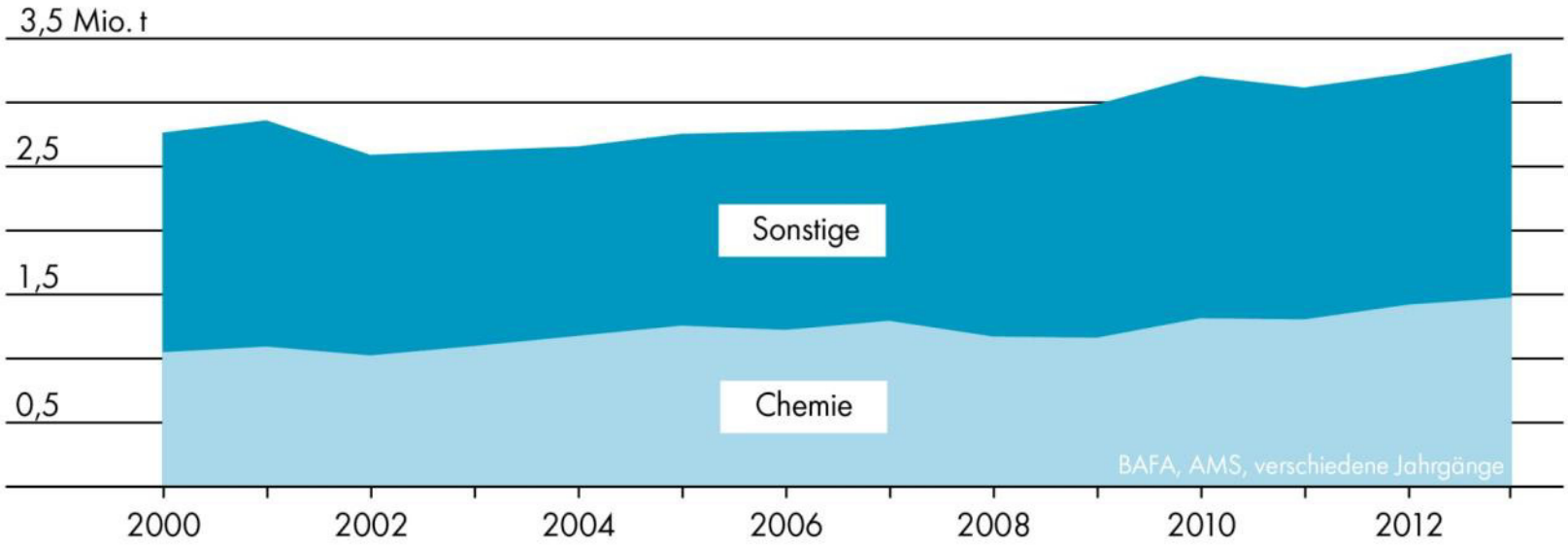
LPG- UND ROHÖL-PREISE



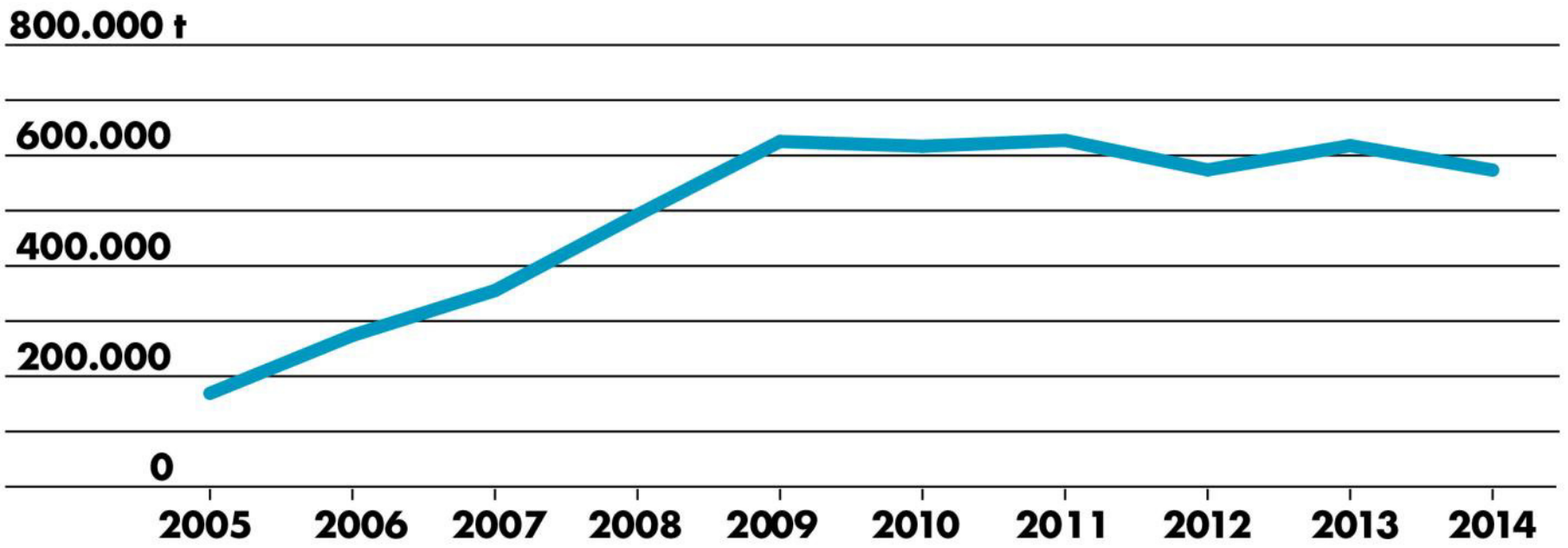
LPG-AUFKOMMEN IN DEUTSCHLAND



LPG-EINSATZ IN DEUTSCHLAND (I)



LPG-EINSATZ IN DEUTSCHLAND (II) - AUTOGAS



destatis 2015

NICHT-AUTOMOBILE ANWENDUNGEN

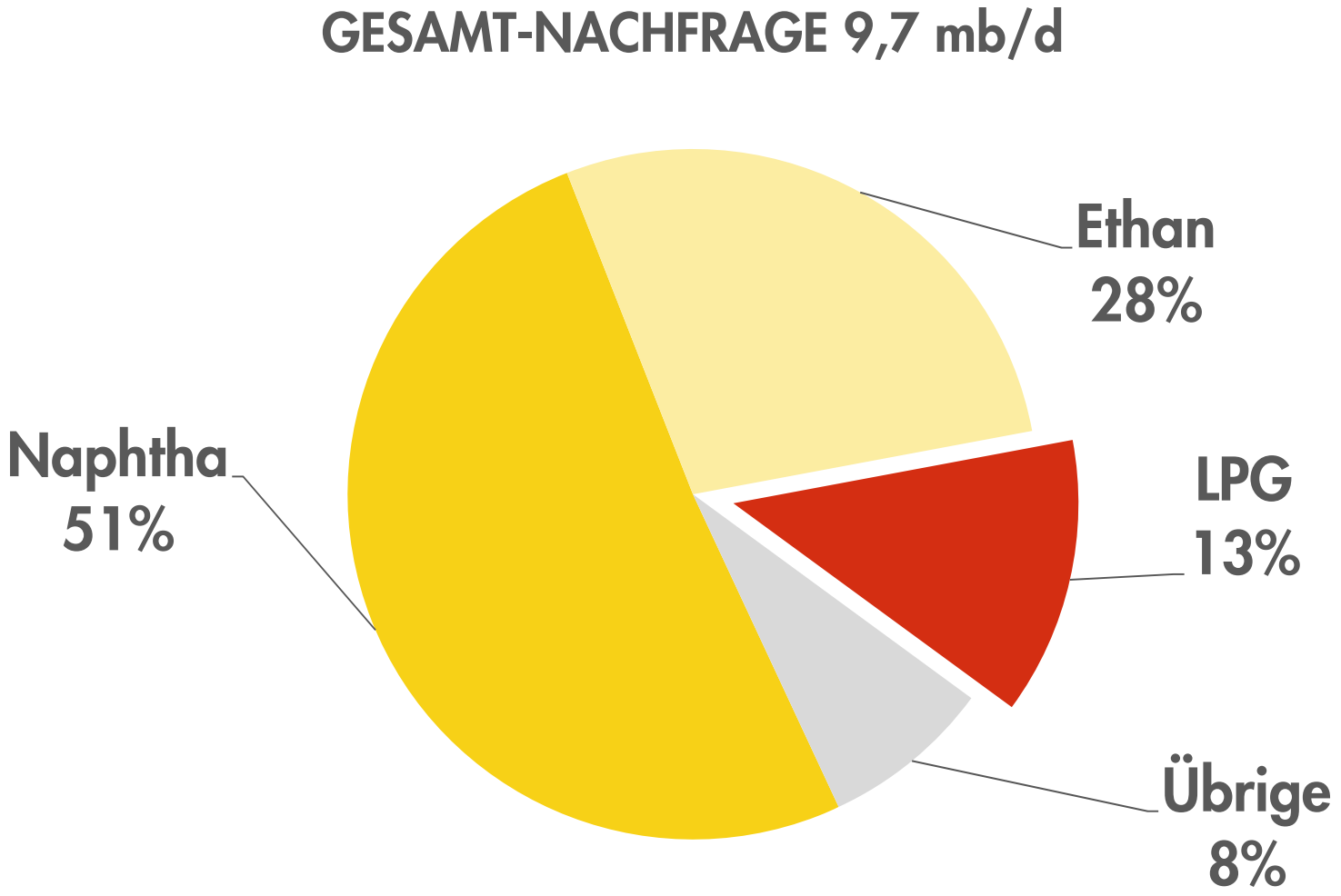
Brennstoff (Heizen, Kochen)

Treibmittel (Spraydosen)

Kühlmittel (Kühlschränke, Klimanlagen)

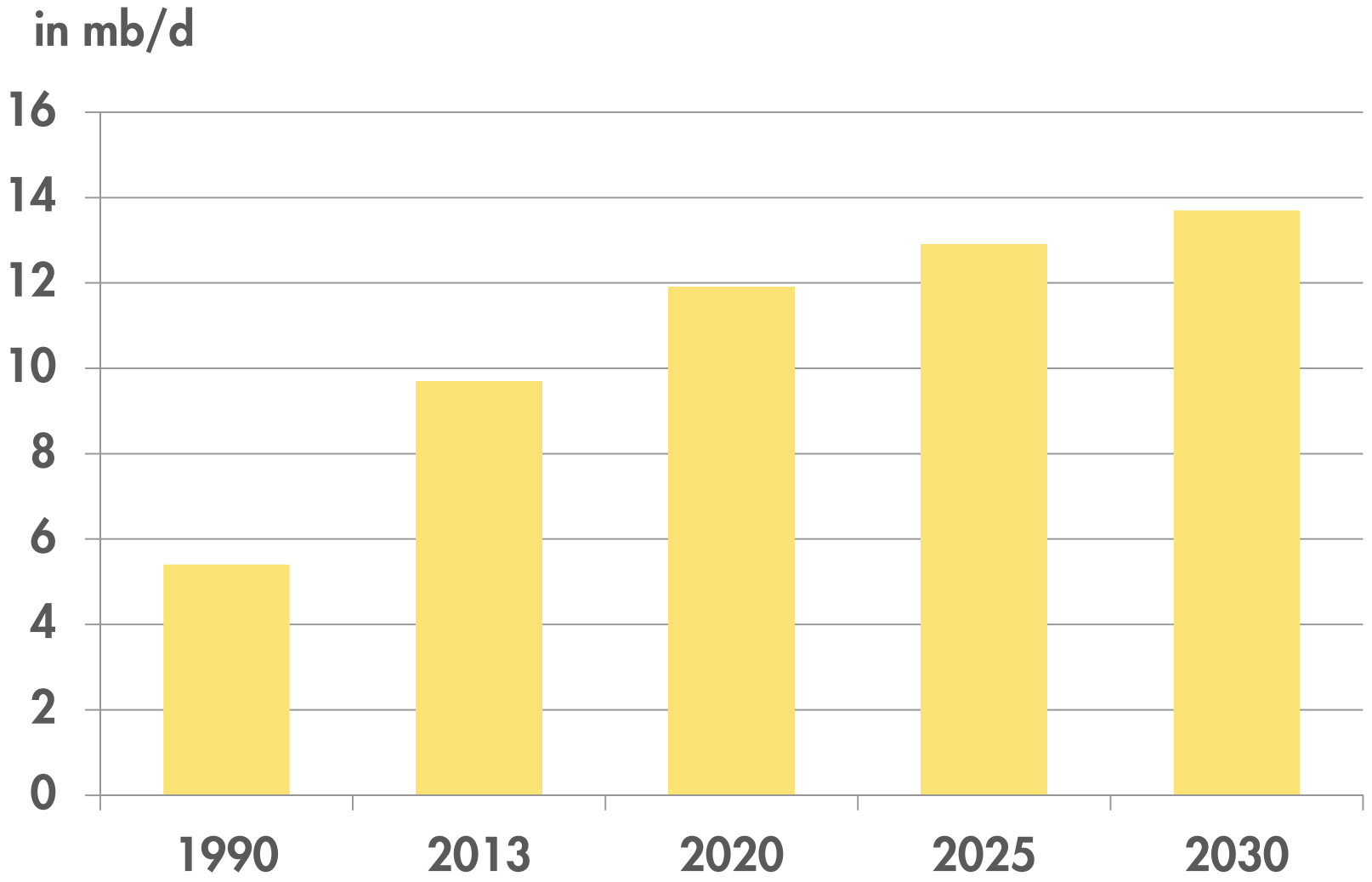
Feedstock (Petrochemie)

PETROCHEMIE – GLOBALE FEEDSTOCKS (2013)



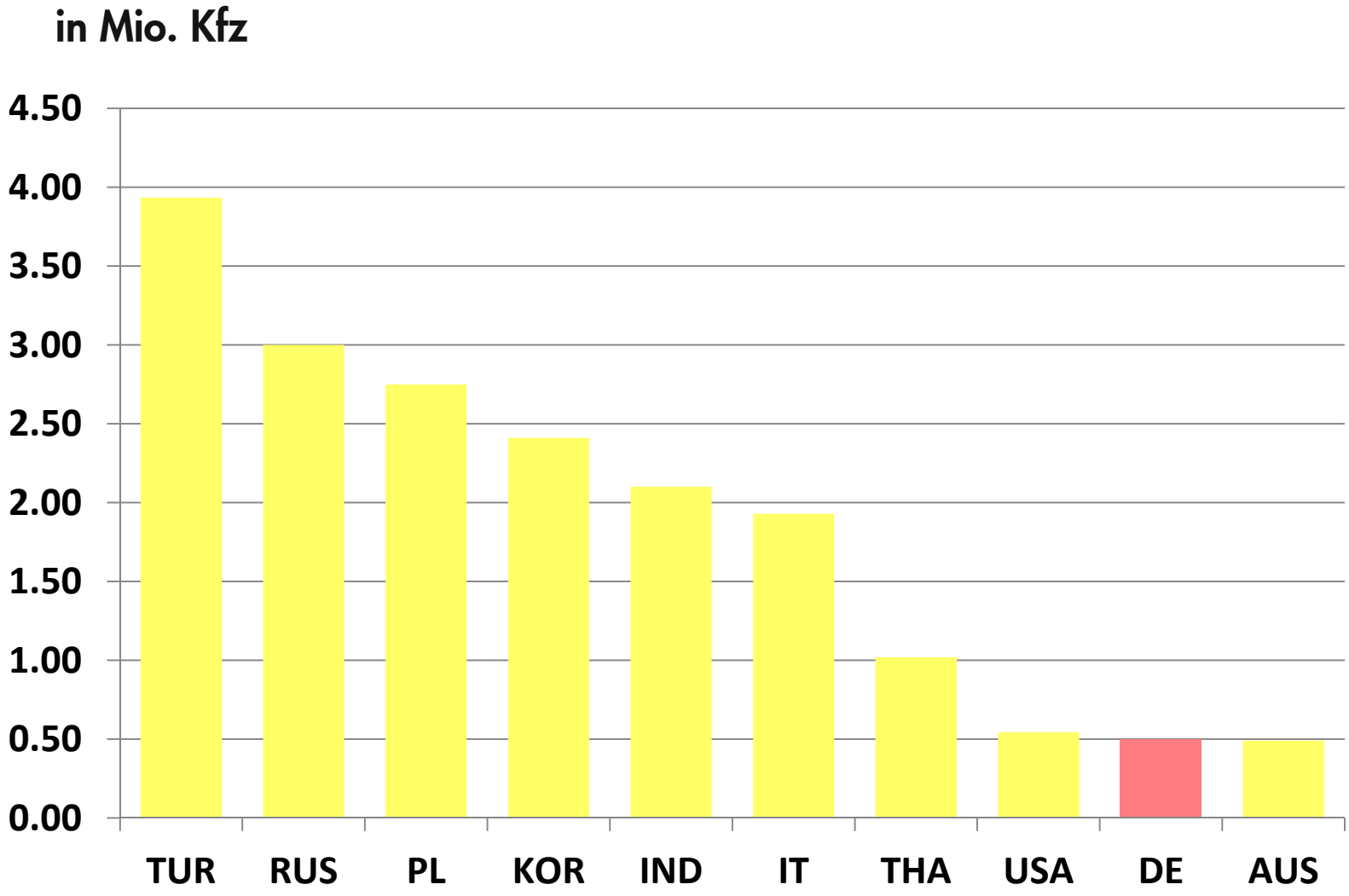
IEA 2014

PETROCHEMIE – GLOBALER FEEDSTOCK-EINSATZ



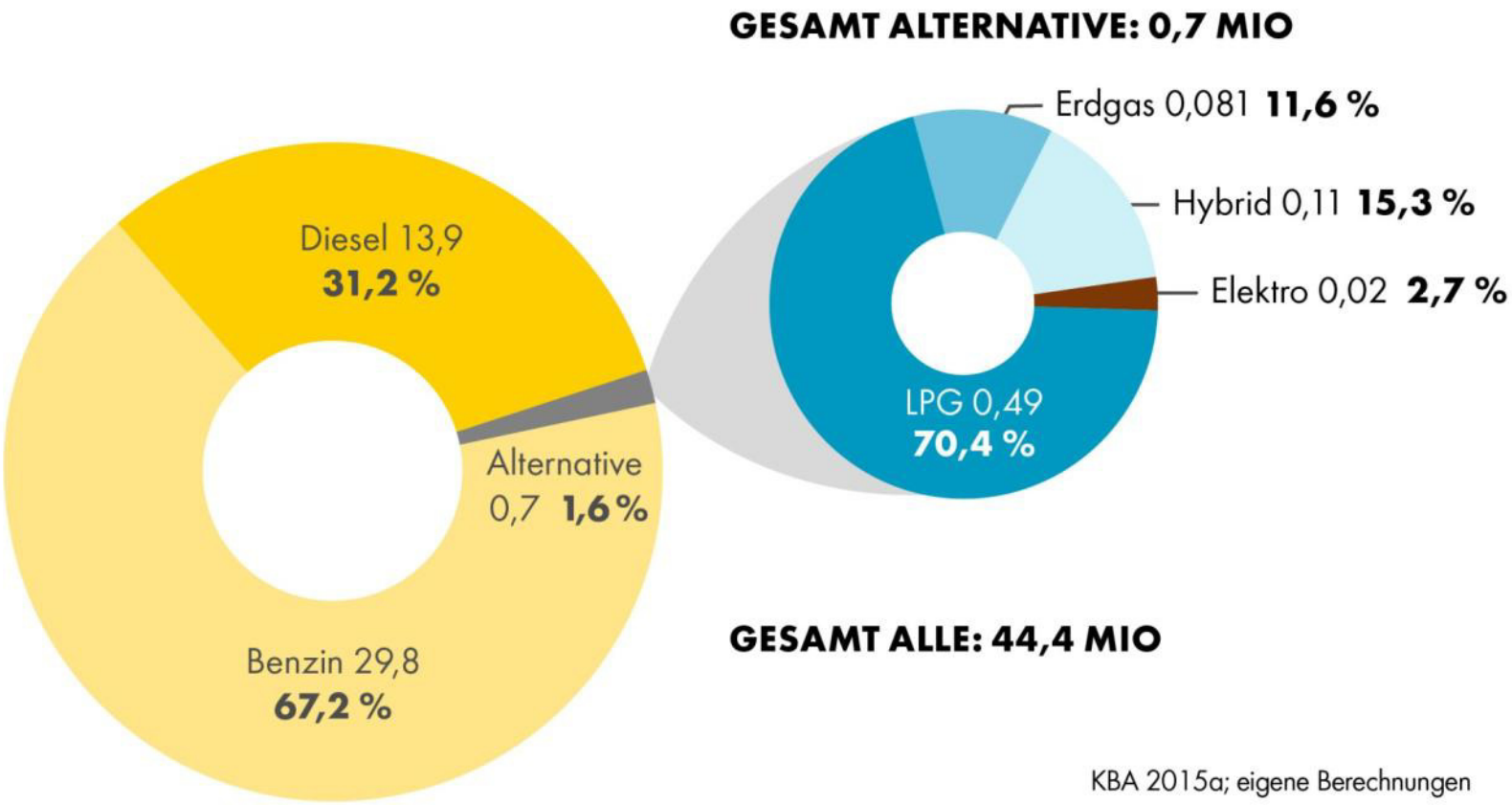
IEA NPS 2014

DIE GRÖSSTEN LPG-FAHRZEUGFLOTTEN



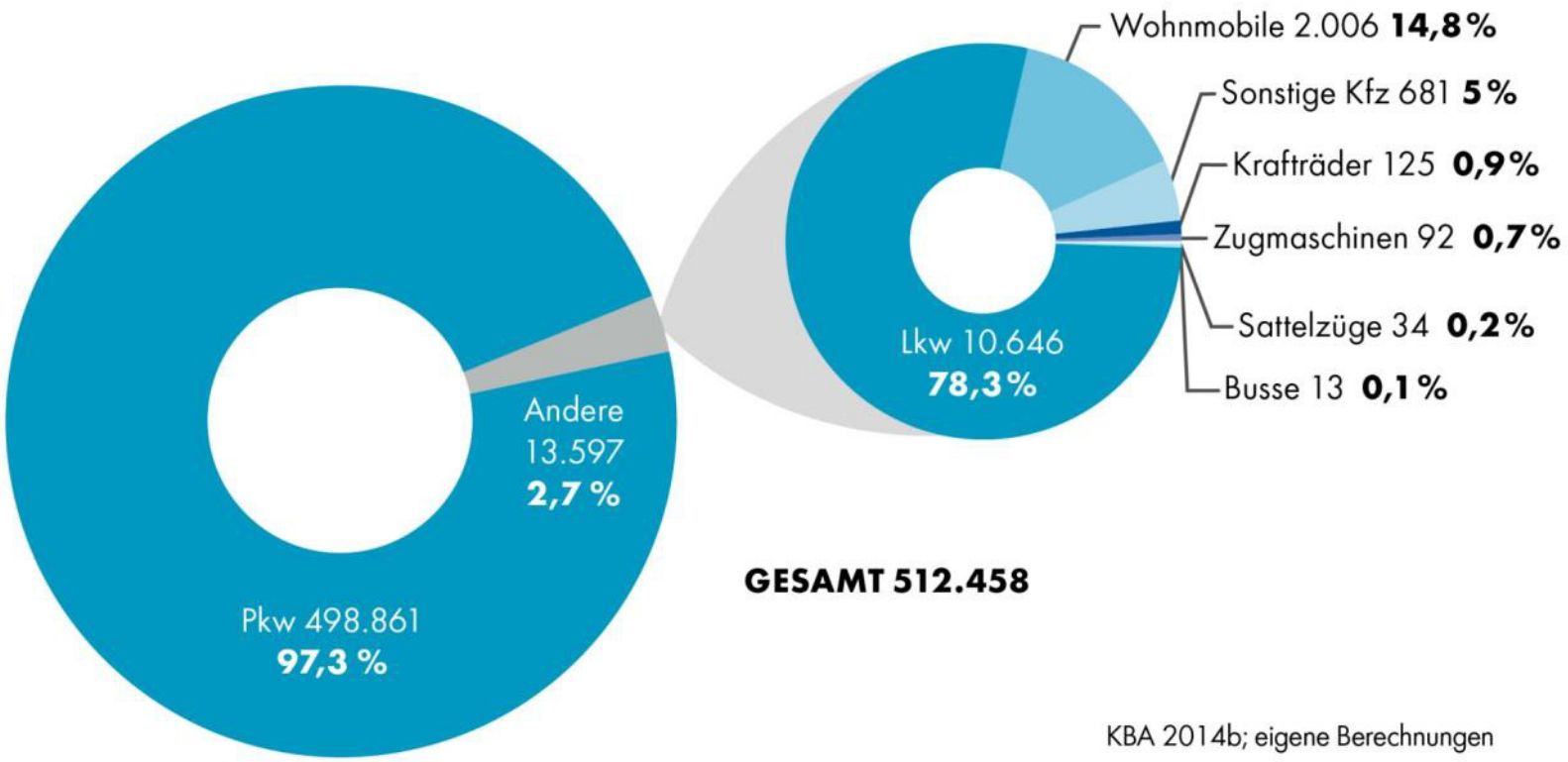
WLPGA/Argus 2014

PKW-BESTAND IN DEUTSCHLAND (2015)



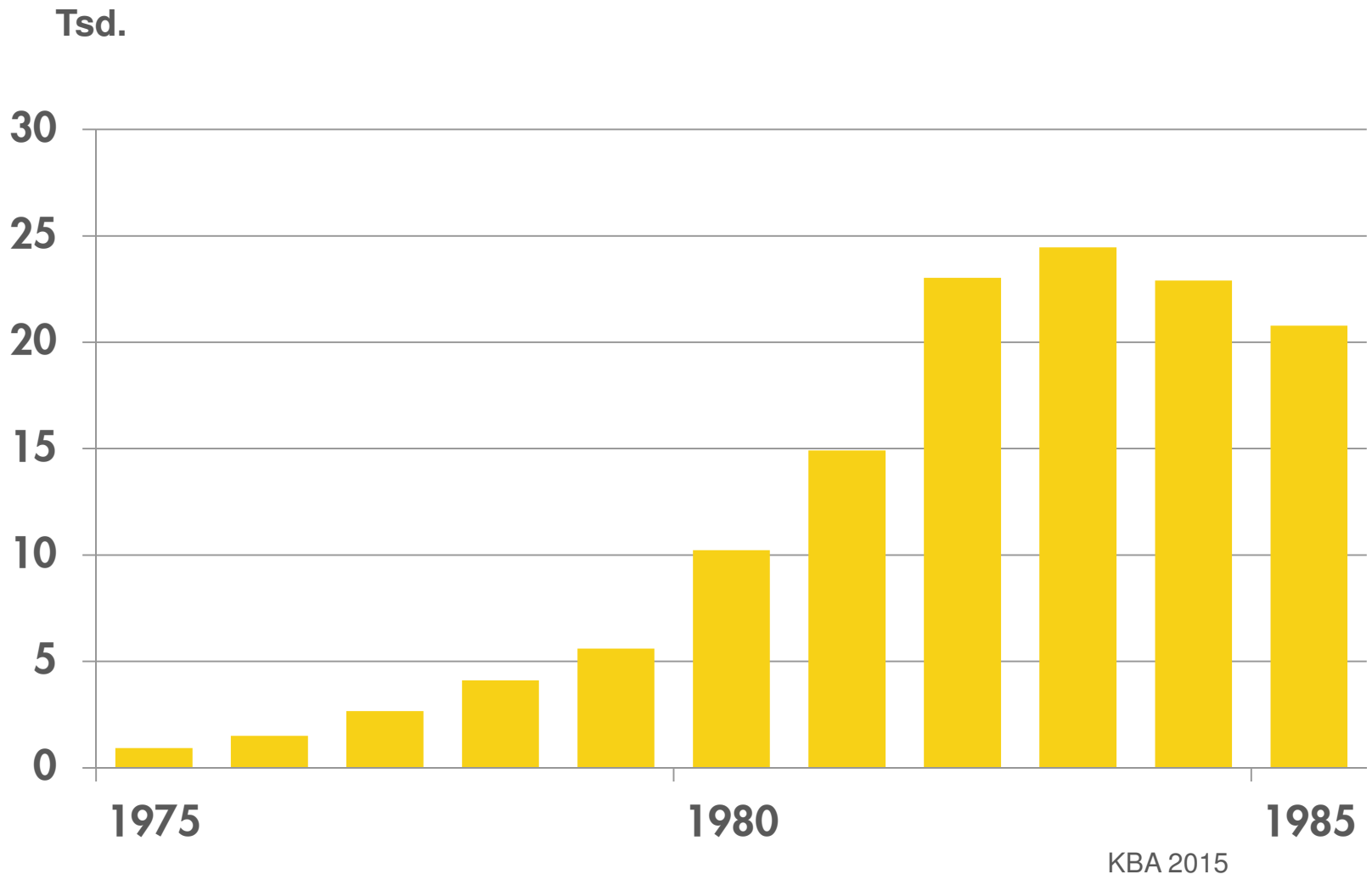
KBA 2015a; eigene Berechnungen

AUTOGAS-FAHRZEUGE IN DEUTSCHLAND (2014)

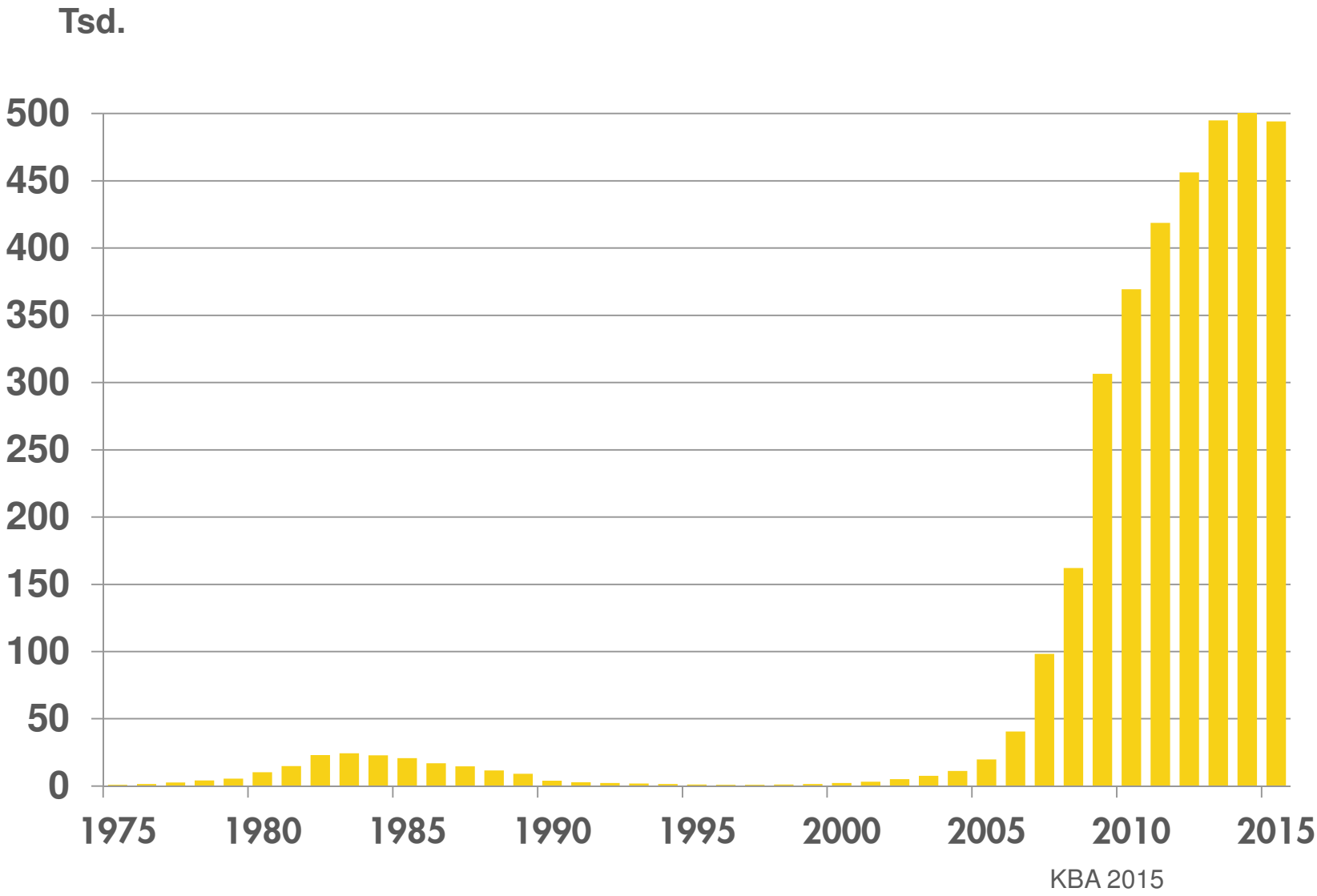


KBA 2014b; eigene Berechnungen

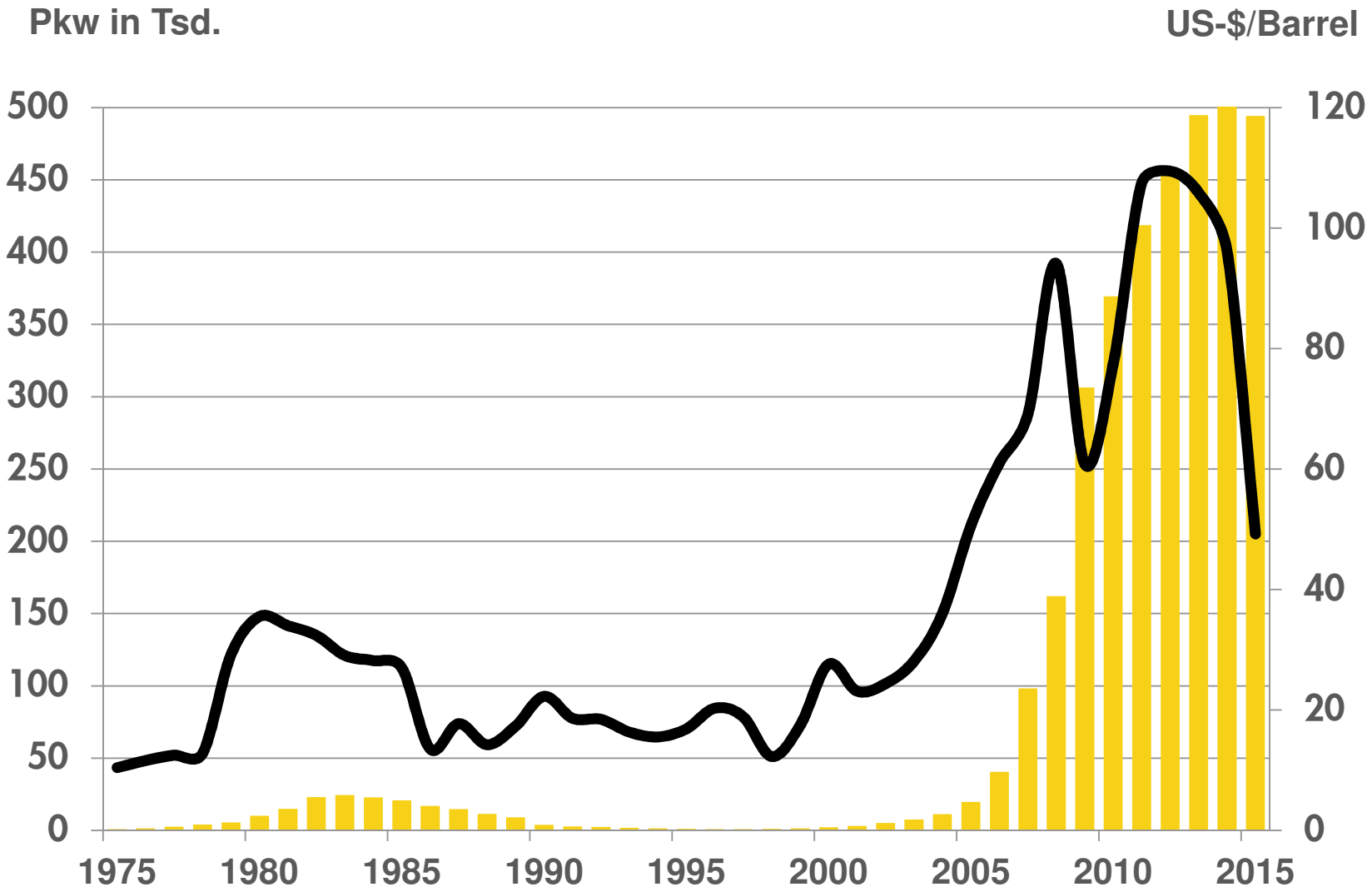
AUTOGAS-BOOM – PKW-BESTAND DEUTSCHLAND (I)



AUTOGAS-BOOM – PKW-BESTAND DEUTSCHLAND (II)

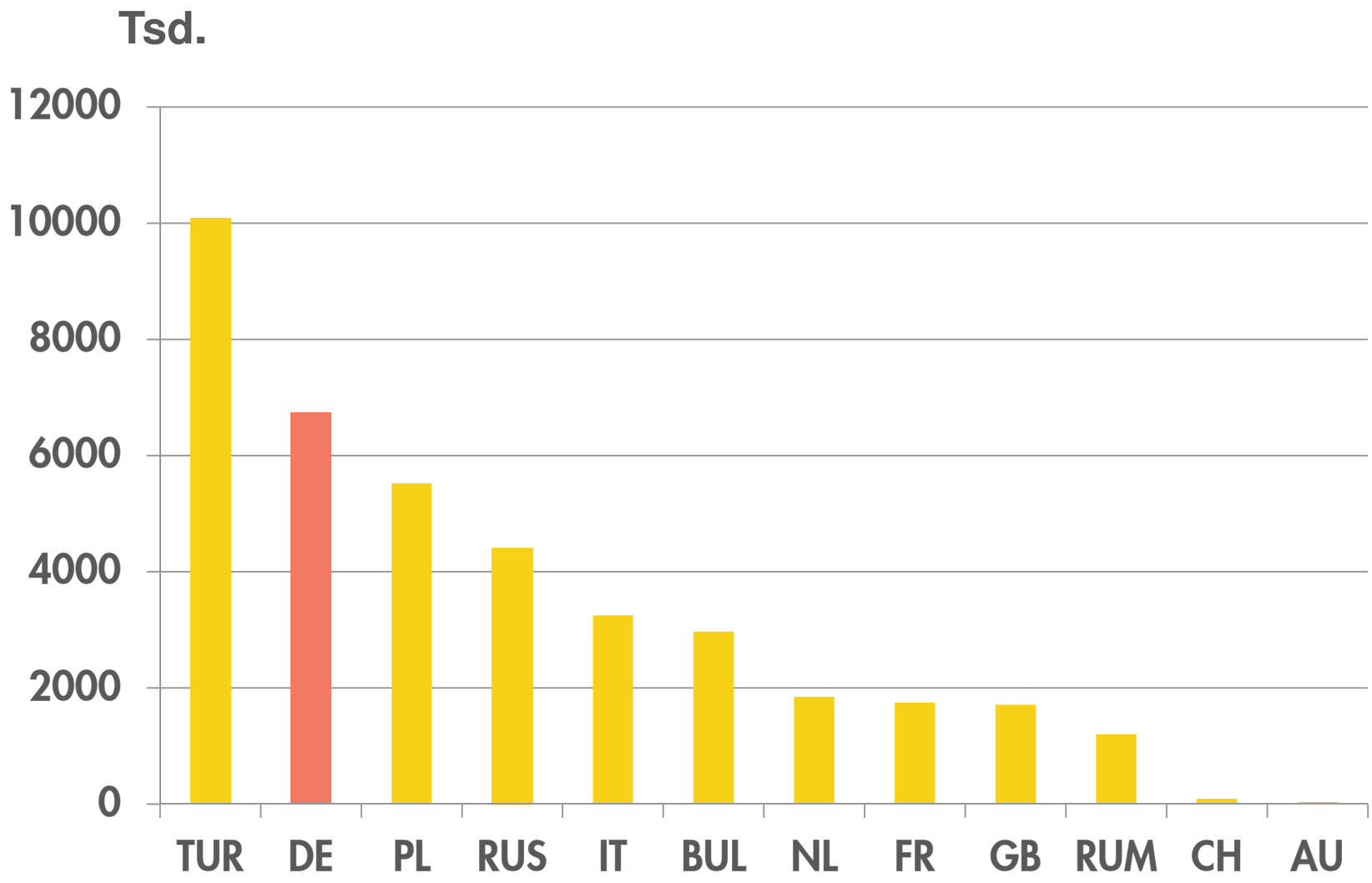


AUTOGAS BOOM IN DEUTSCHLAND & ROHÖLPREIS



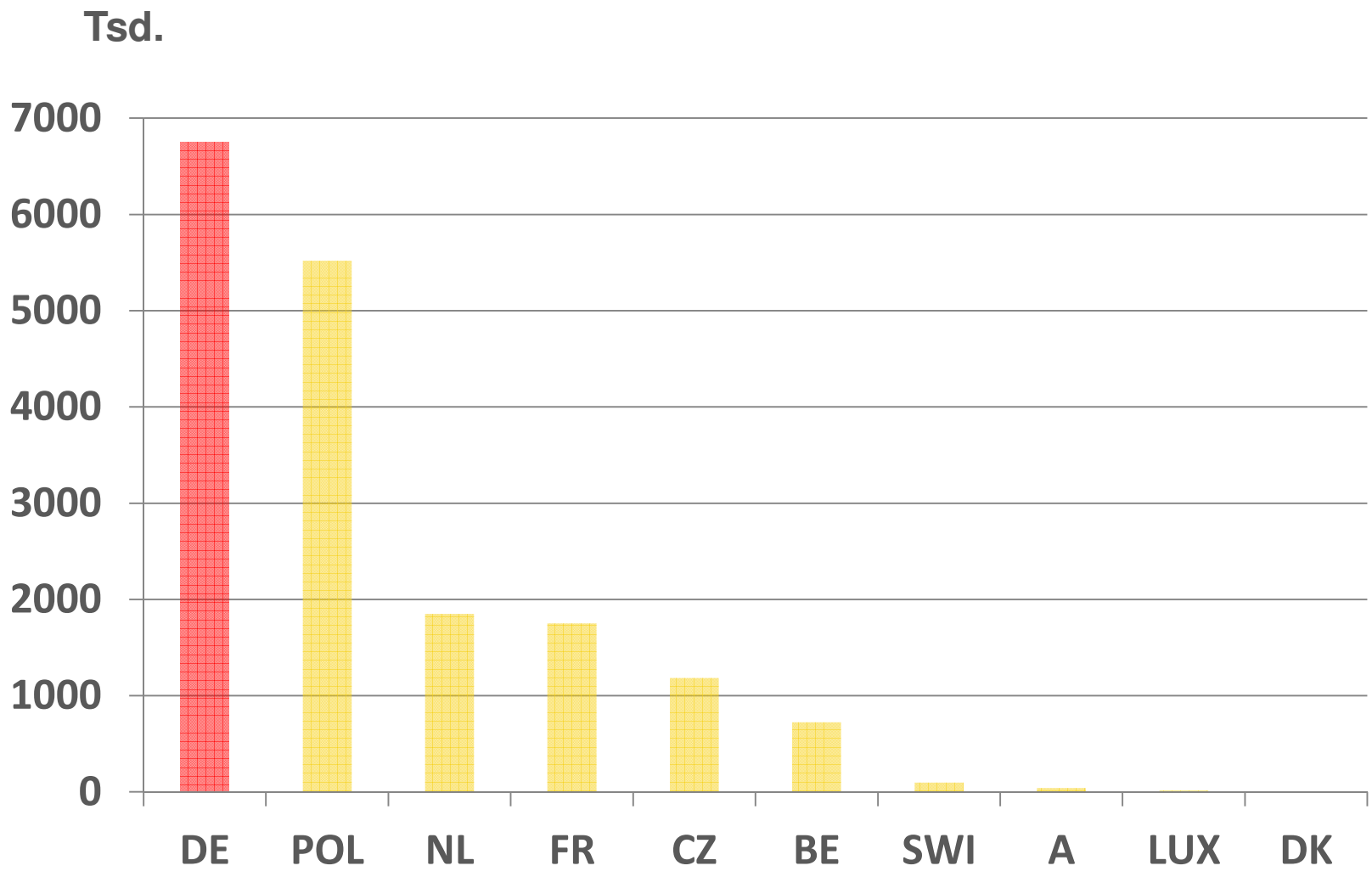
KBA 2015; MWV 2015

AUTOGAS-TANKSTELLEN IN EUROPA



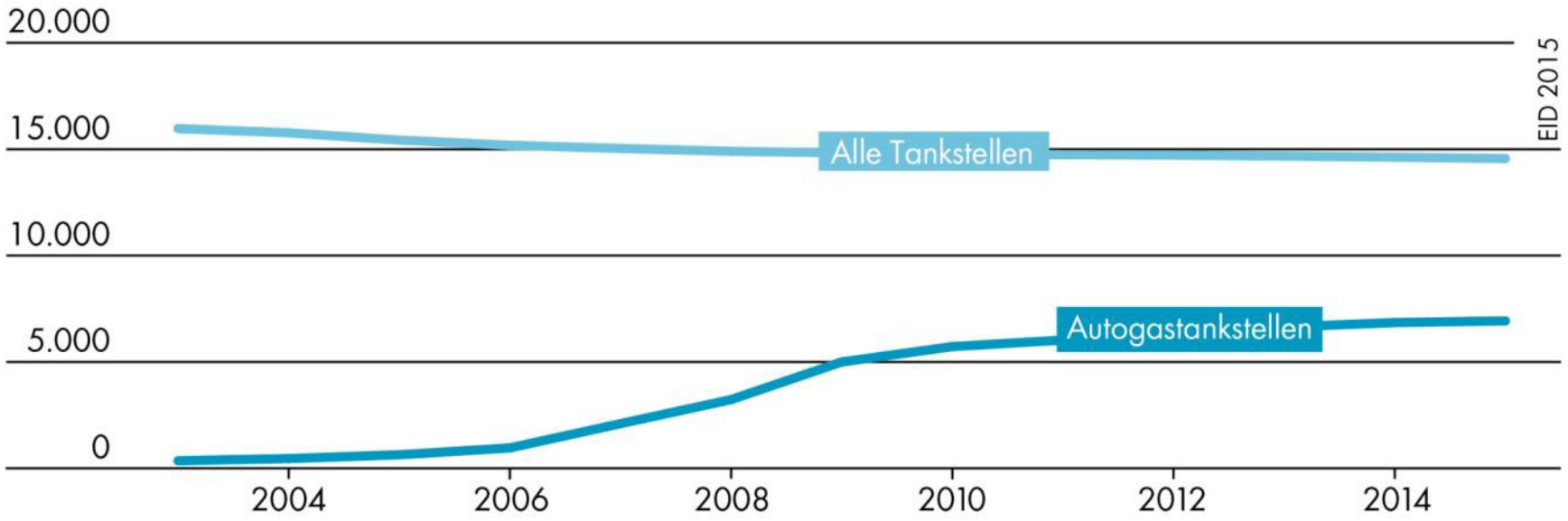
WLPGA 2014

AUTOGAS-TANKSTELLEN NACHBARSTAATEN (D)

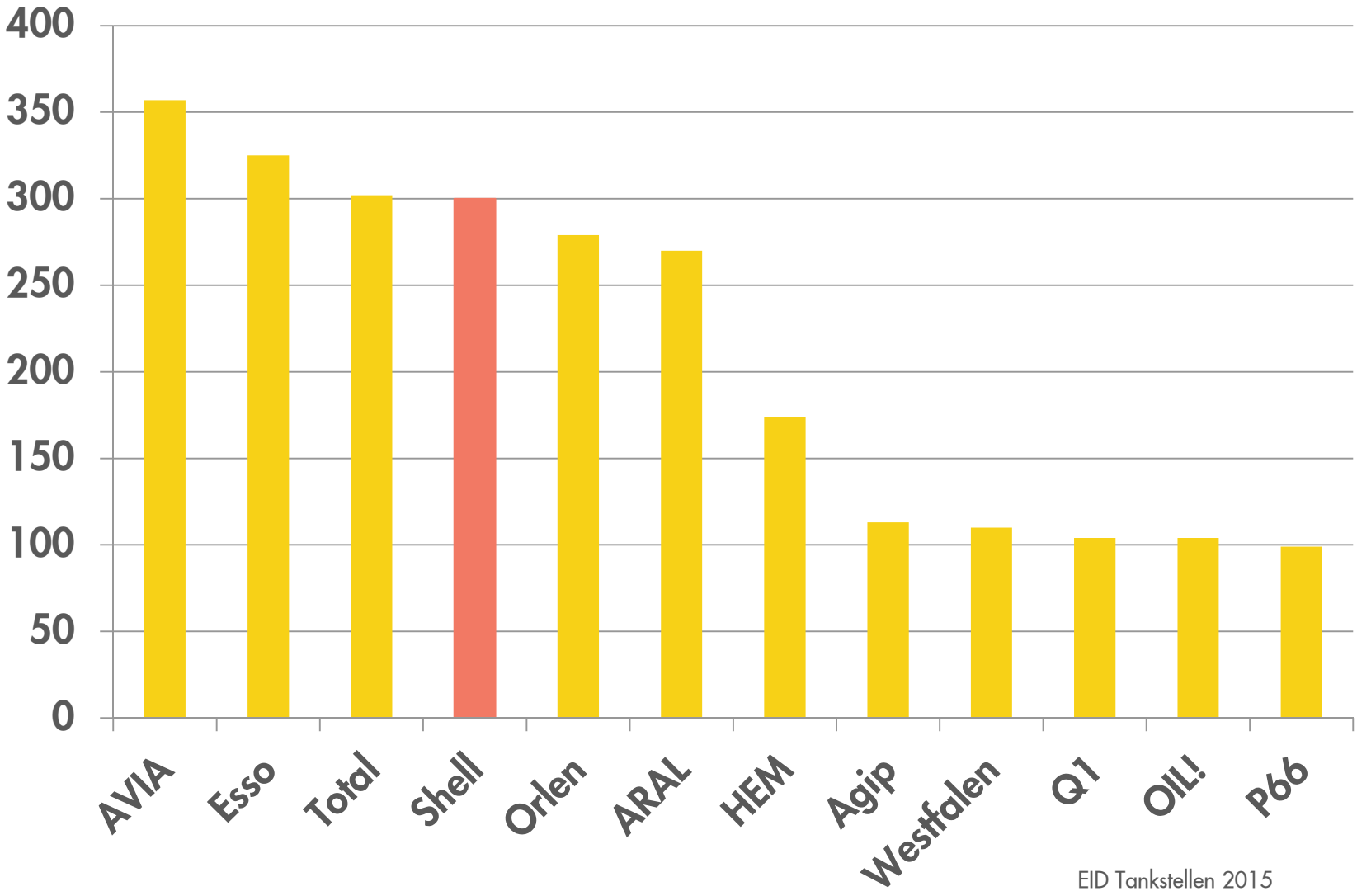


WLPGA 2014M; mylpg.eu 2015

AUTOGAS-TANKSTELLEN IN DEUTSCHLAND (I)



AUTOGAS-TANKSTELLEN IN DEUTSCHLAND (II)



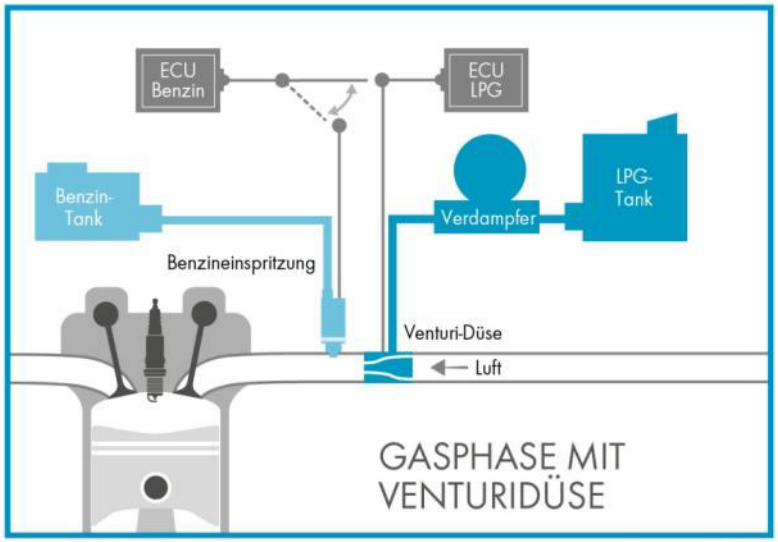
EID Tankstellen 2015

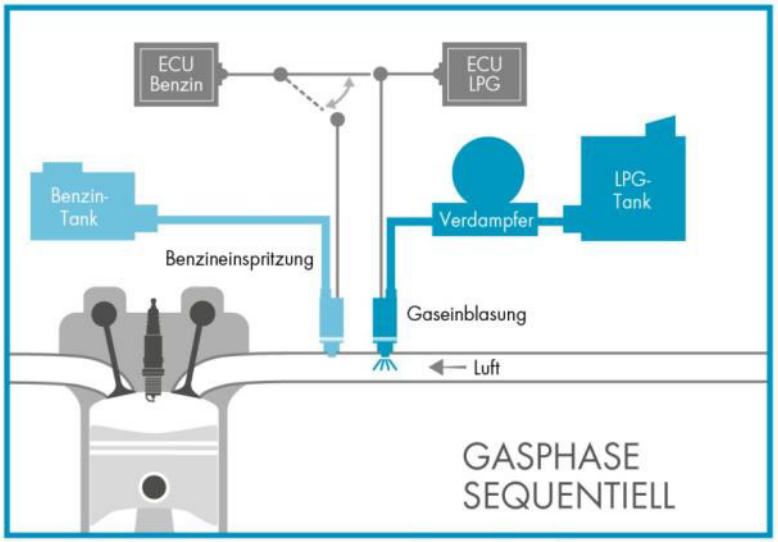
LPG – ANWENDUNGSPOTENZIALE IM VERKEHR

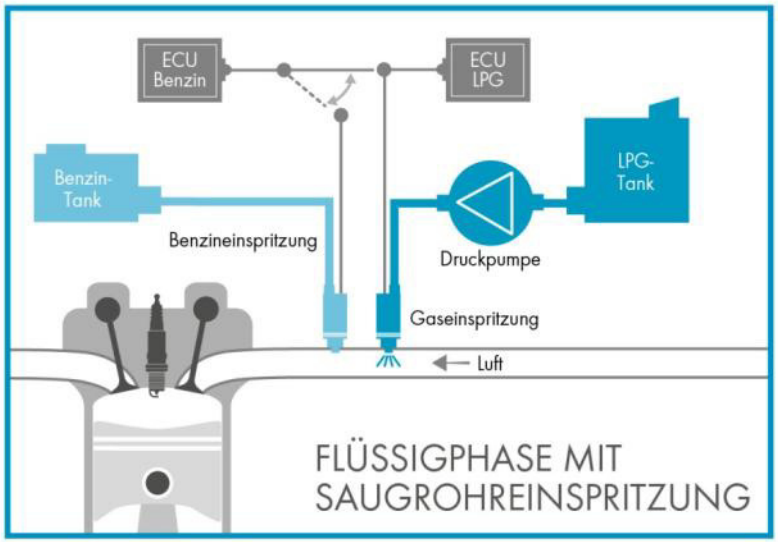
Kriterien	Pkw	Nfz		Bahn	Schiff	Flugzeug
		Leicht (Otto/Diesel)	Schwer (Diesel)			
Verfügbarkeit technischer Lösungen	++	++/o	o	o	o	– –
Integrationsaufwand Energiewandler	++	++/o	– –	– –	– –	– –
Integrationsaufwand Speichersystem	++	++	– –	o	– – (++)*	– –
Infrastrukturverfügbarkeit	++	++	++	– –	o	– –

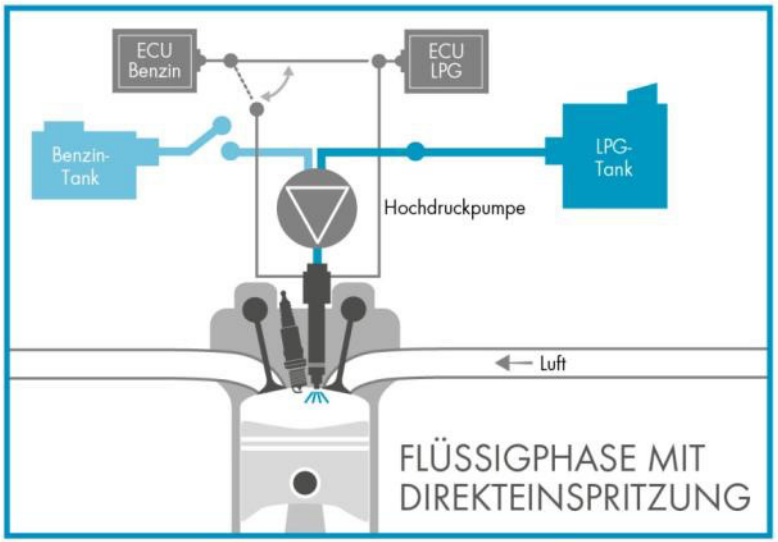
++ Hohe Eignung o Eingeschränkte Eignung – – Keine Eignung *LPG Transportschiffe

AUTOGAS - FAHRZEUGTECHNIK









LPG/AUTOGAS – WARUM?

WARUM wird LPG/Autogas eingesetzt?

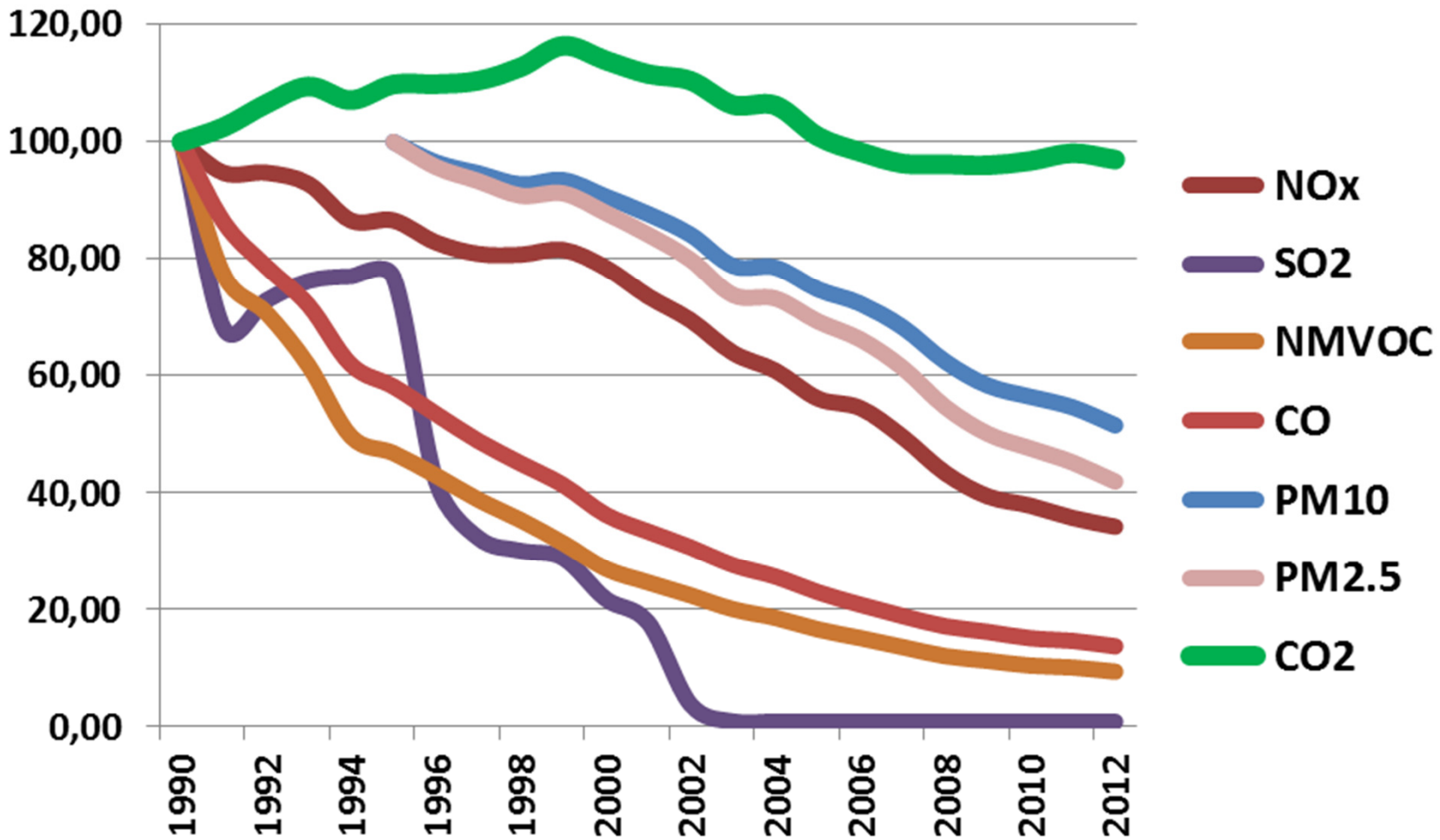
- Energie → Diversifizierung Energieversorgung?
- Umwelt → weniger Luftschadstoffemissionen?
- Klima → Treibhausgasemissionen?
- Wirtschaftlichkeit → geringere Autokosten?

LPG-Studie: Begründungen überprüfen/stützen

AUTOGAS UND LUFTQUALITÄT (I)

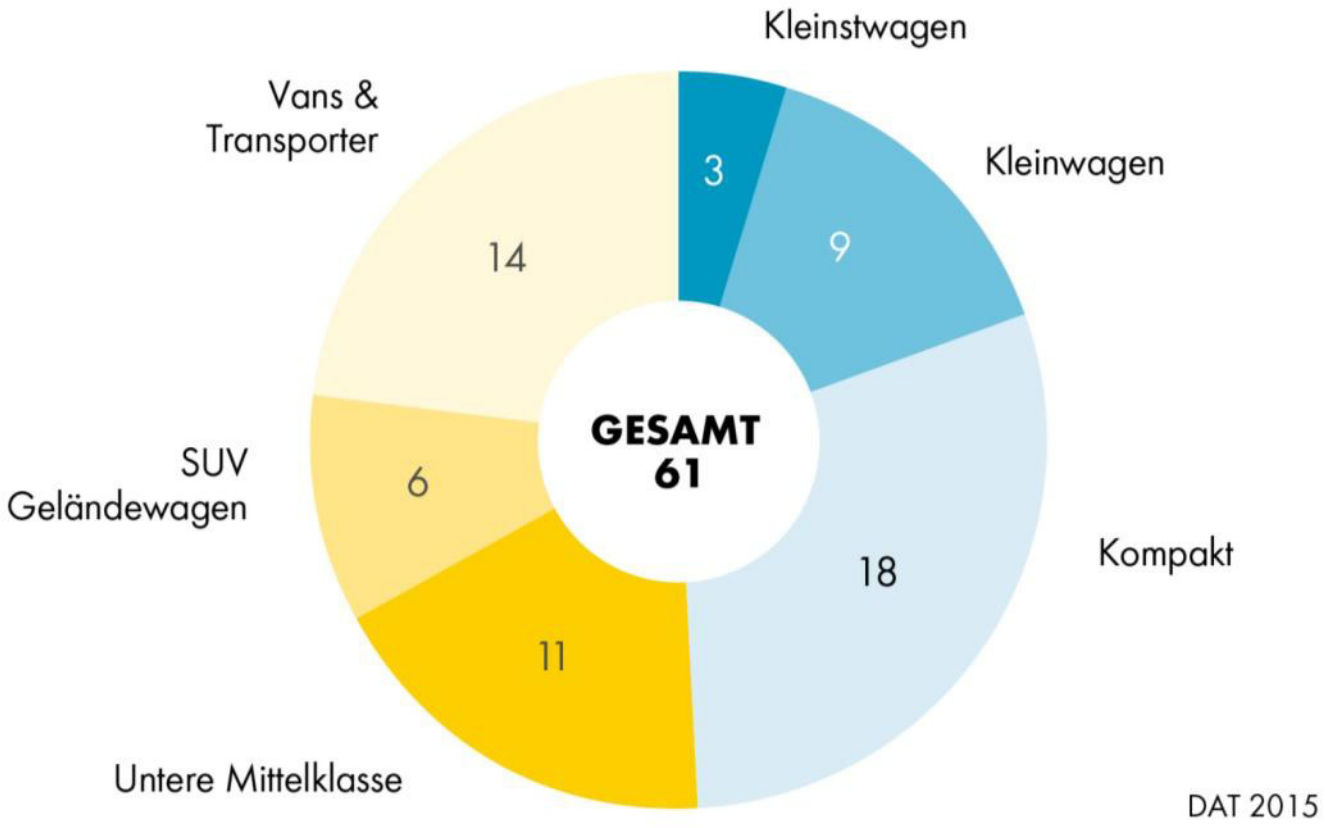
MAN Bus/Trucks

AUTOGAS UND LUFTQUALITÄT (II)

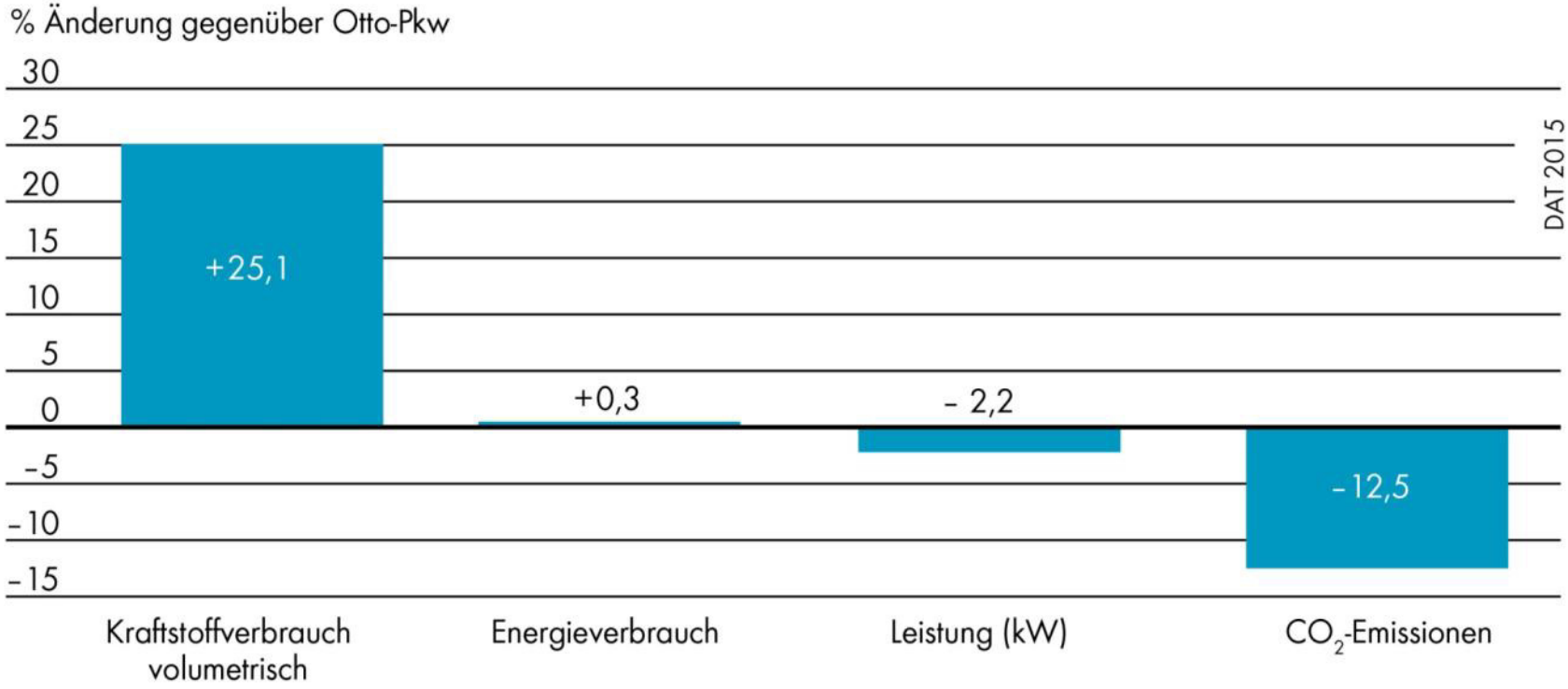


UBA 2013

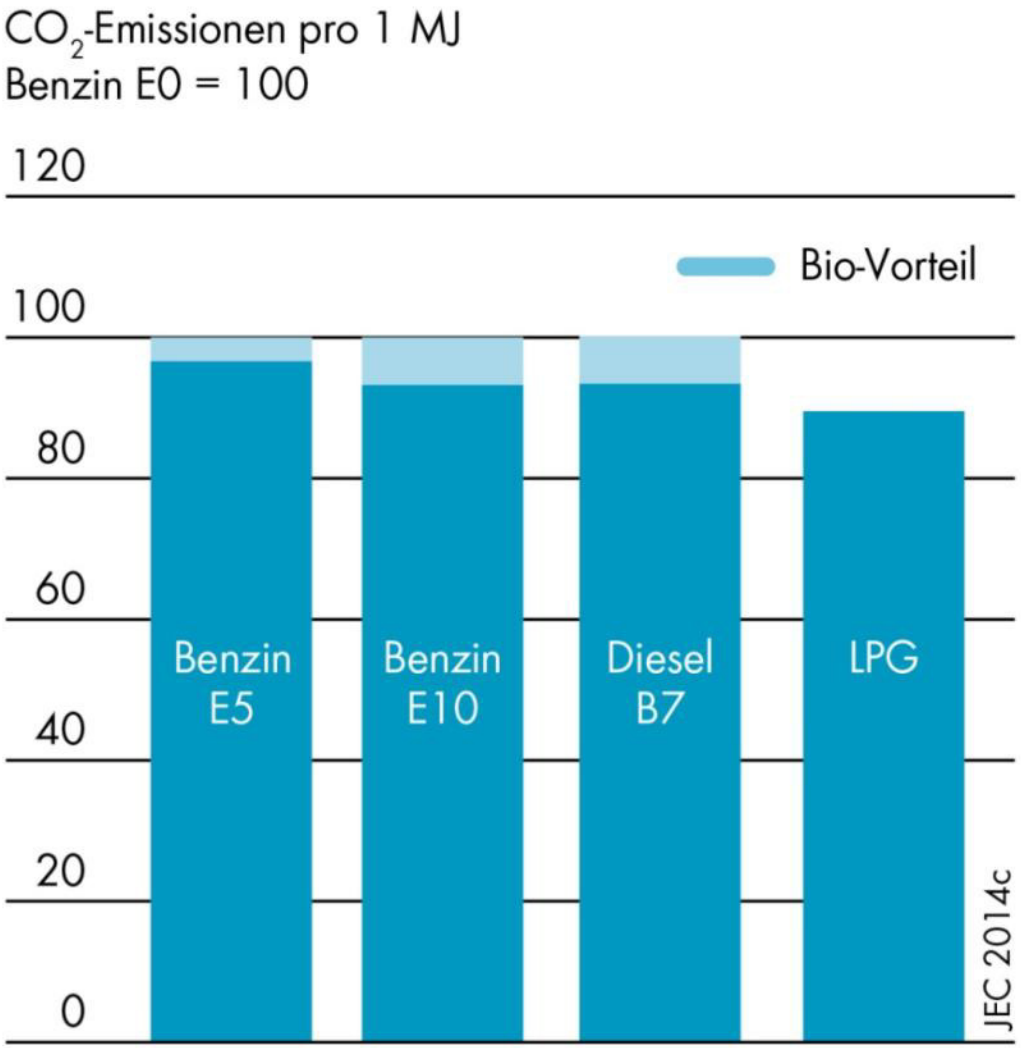
AUTOGAS-MODELLE IN DEUTSCHLAND (2015)



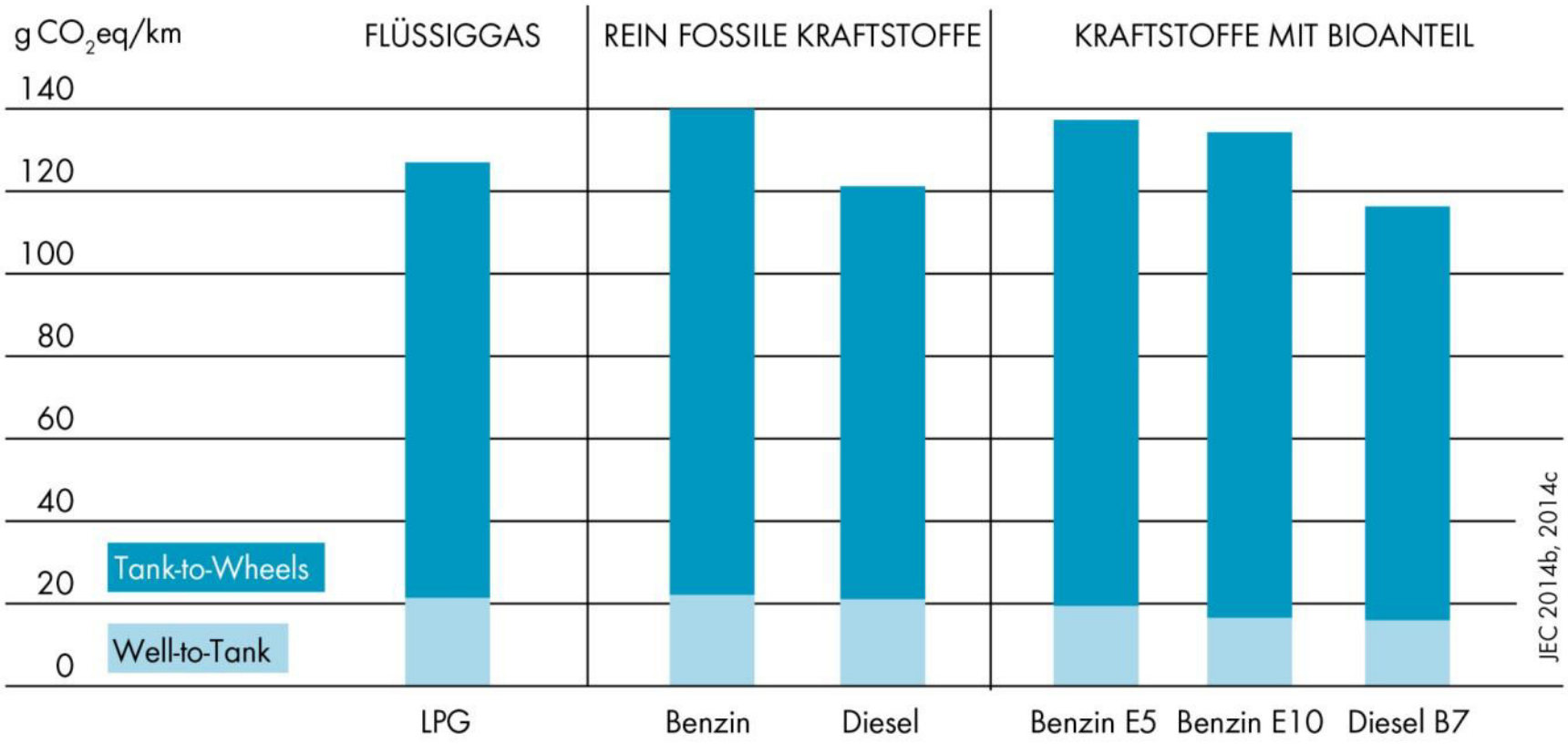
PERFORMANCE AUTOGAS-PKW (2015)



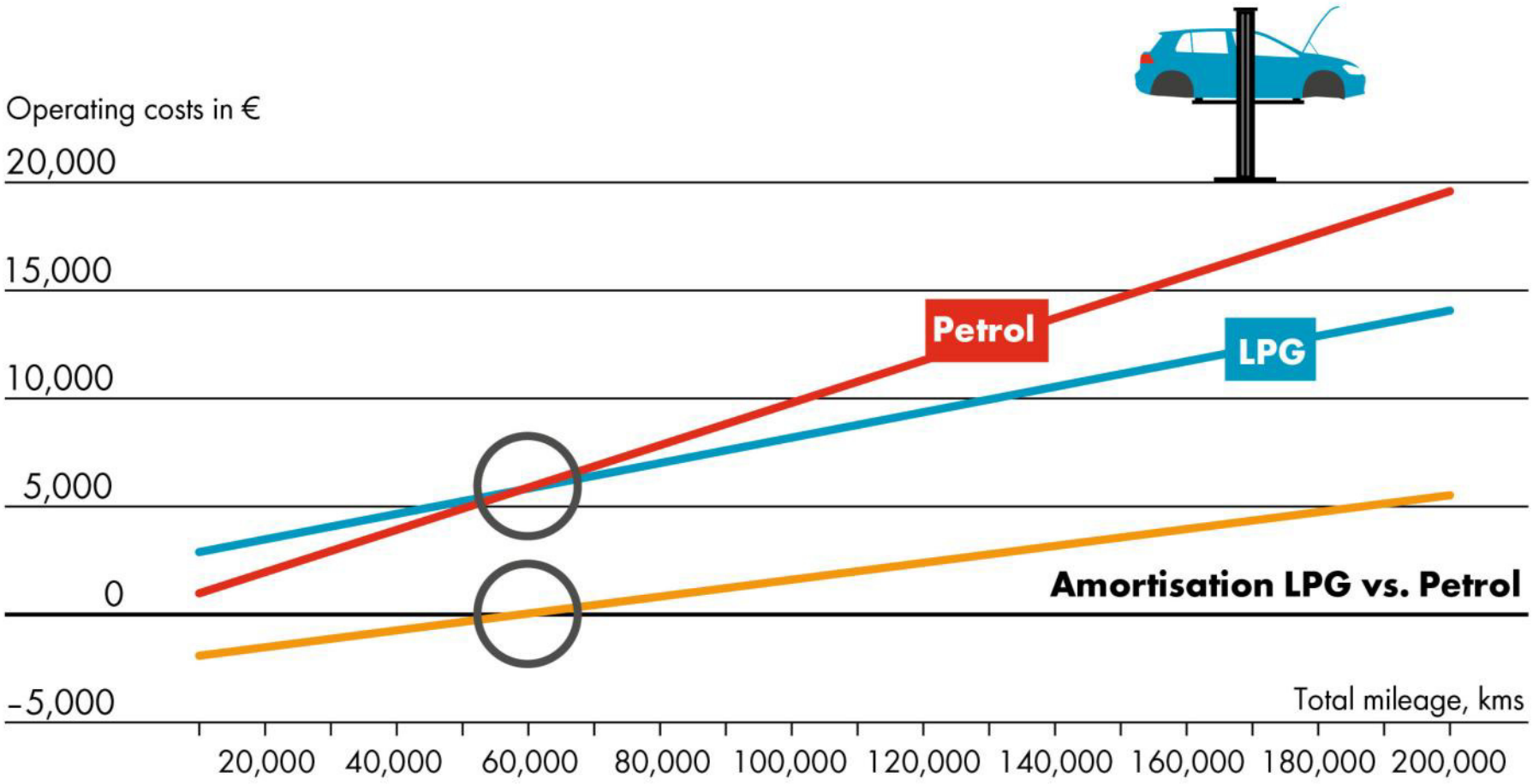
DIREKTE TREIBHAUSGAS-EMISSIONEN KRAFTSTOFFE



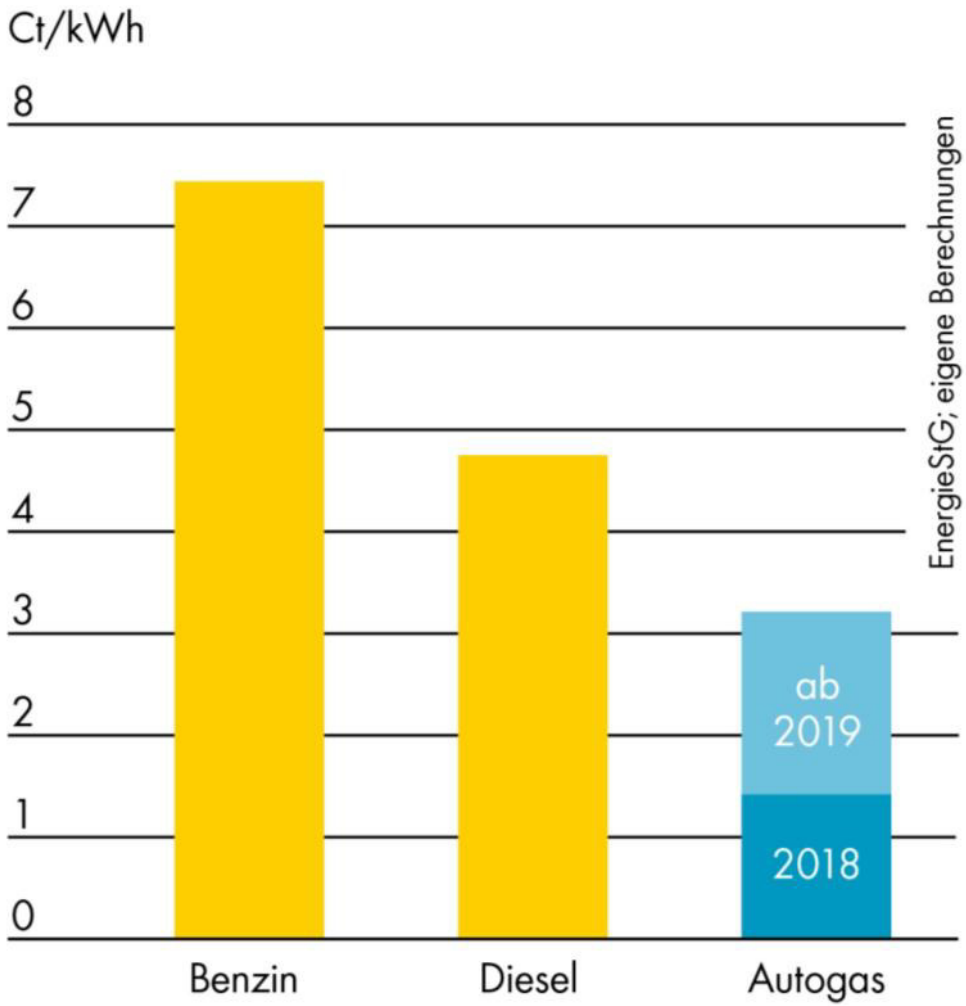
THG-GESAMTBILANZ PKW-ANTRIEBE



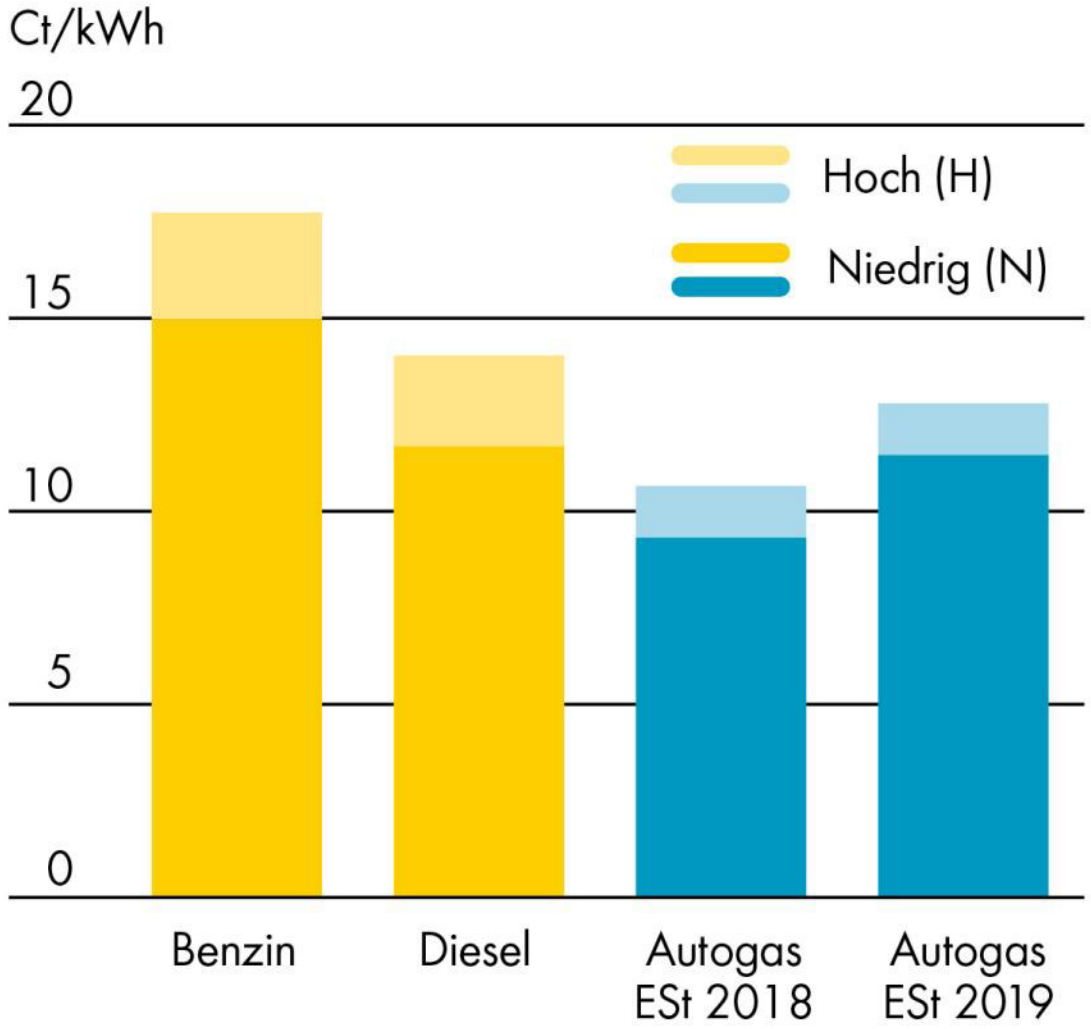
OPERATING COST / COST OF OWNERSHIP



AUTOGAS UND ENERGIESTEUER

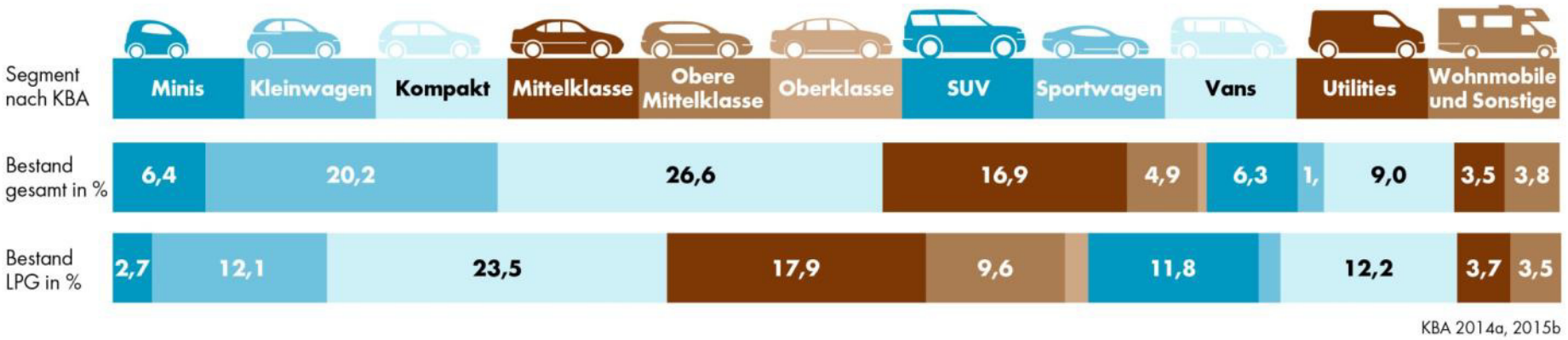


AUTOGAS UND KRAFTSTOFFPREISE



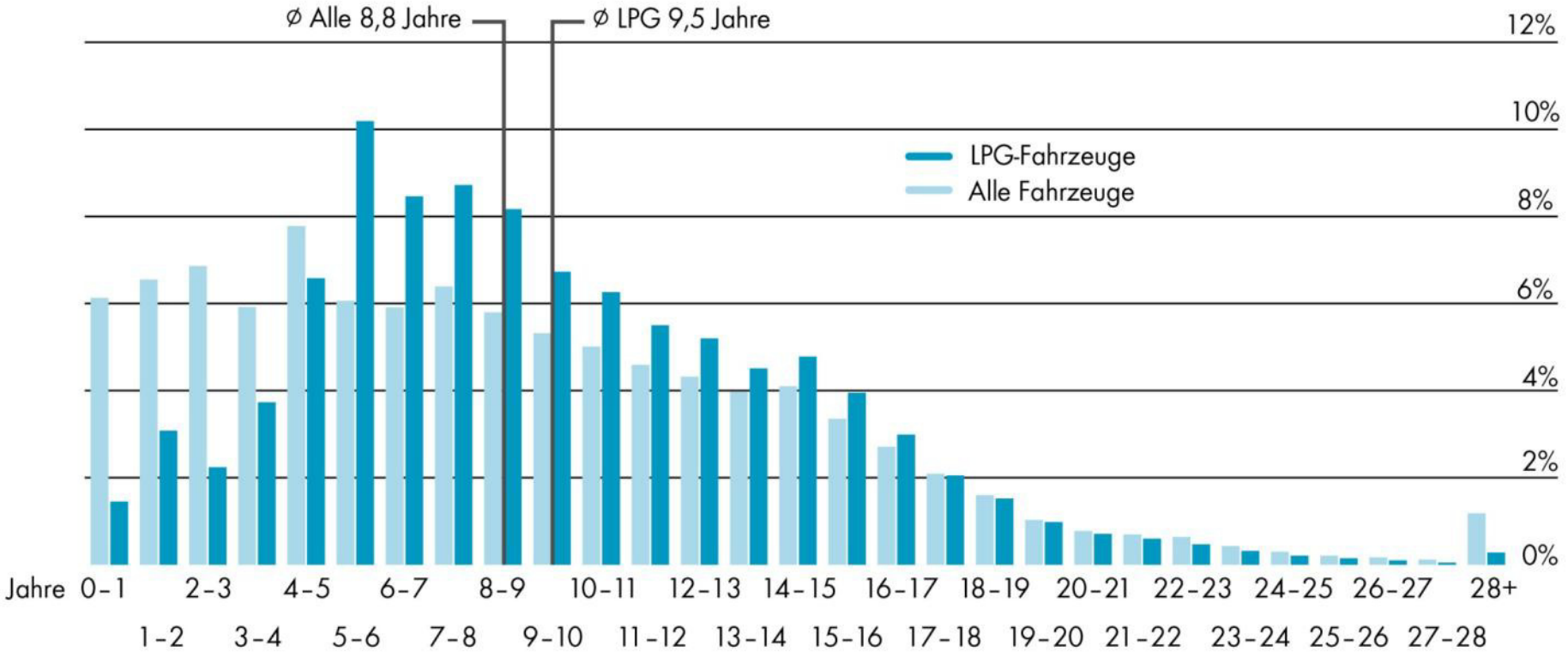
DVFG, MWV; Destatis 2015; eigene Berechnungen

PKW-BESTAND NACH SEGMENTEN



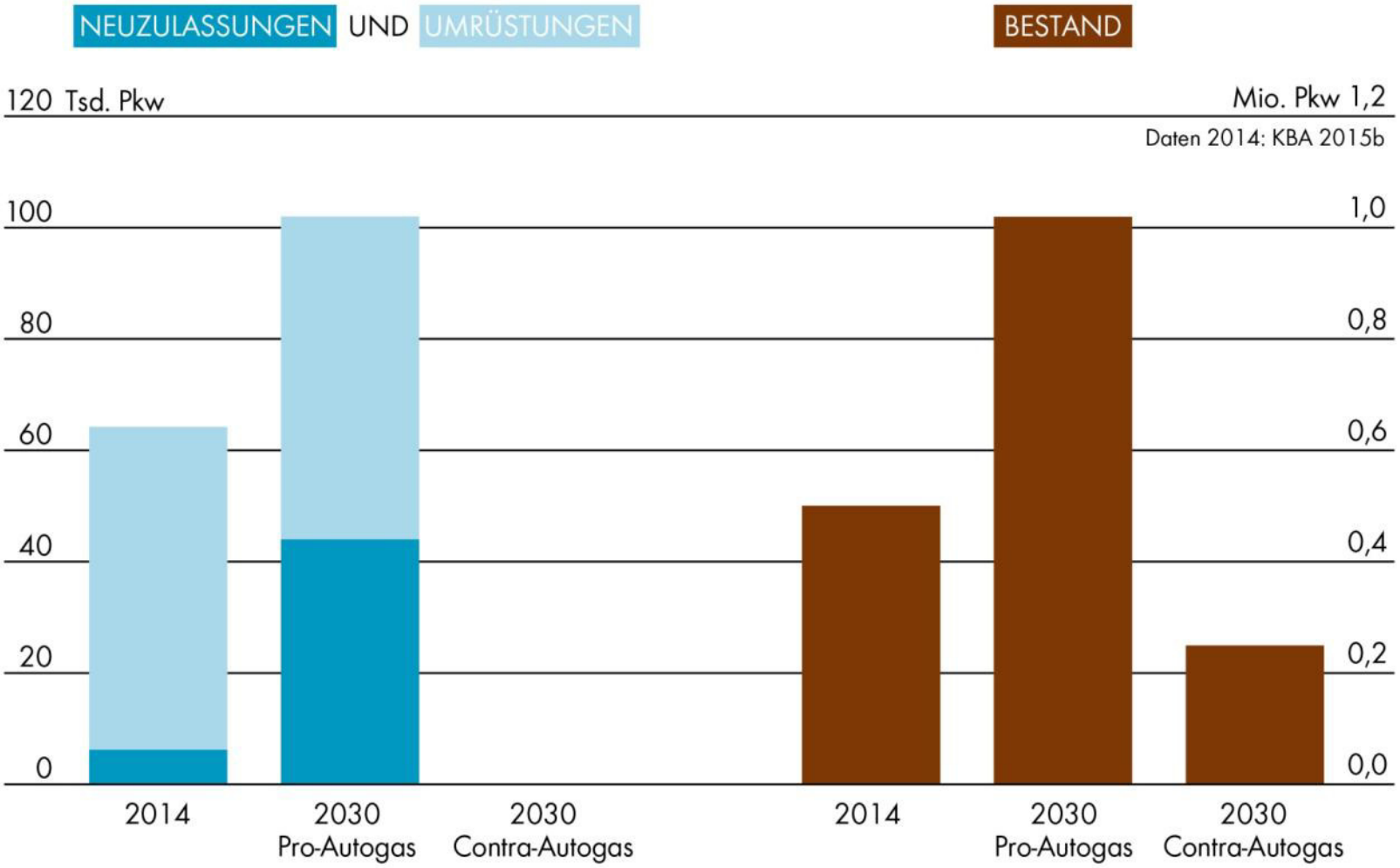
KBA 2014a, 2015b

PKW-BESTAND NACH FAHRZEUGALTER (2014)

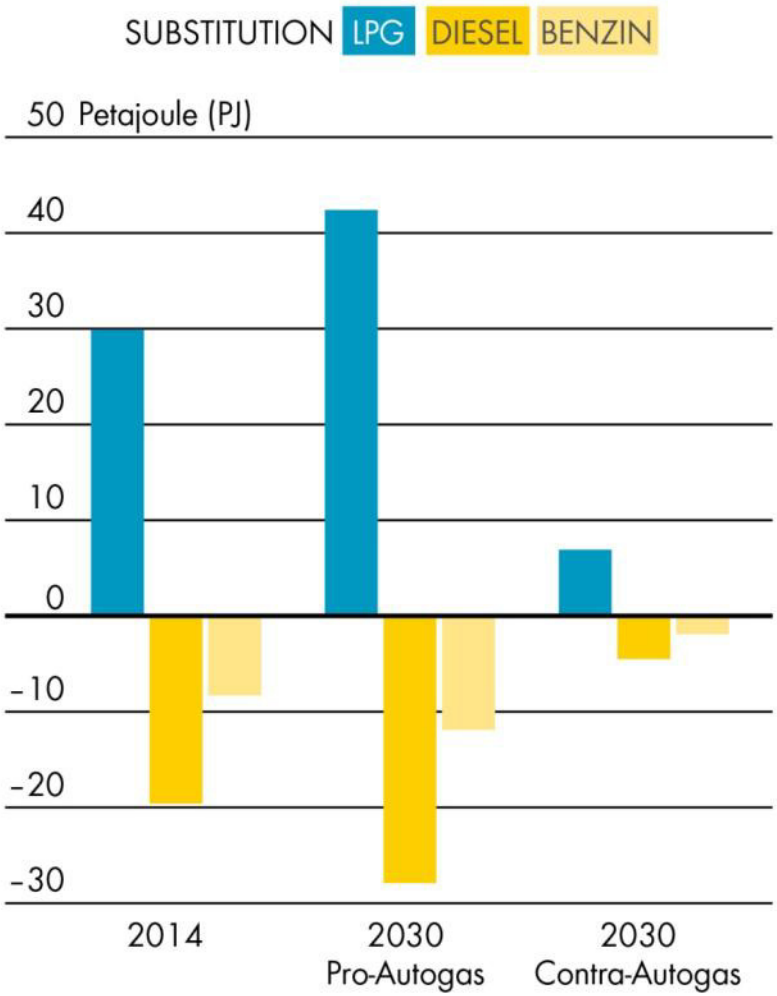


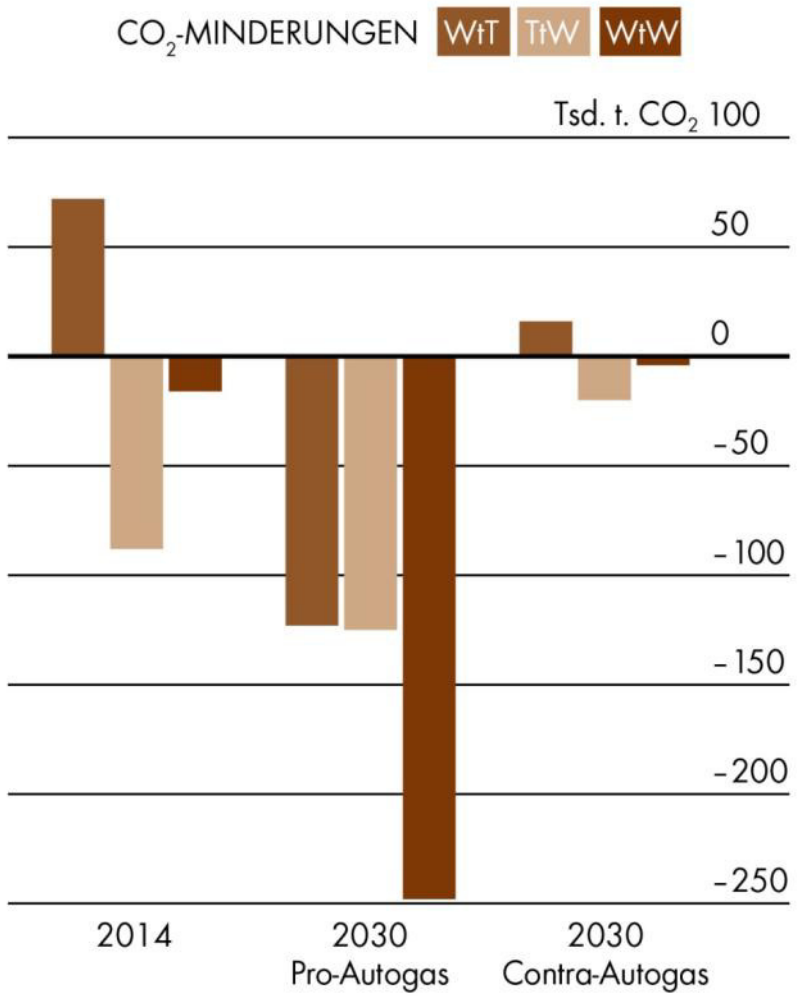
KBA 2014, 2015

AUTOGAS-SZENARETTE (I) - FAHRZEUGE



AUTOGAS-SZENARETTE (II) – ENERGIE/THG





AUSBLICK – LPG FUTURE FUEL?

- LPG: mehr als nur ein Niche Fuel?
- steigendes globales LPG-Aufkommen
- ozonschonendes Kühl/Treibmittel
- mehr LPG als Feedstock in Petrochemie
- nachhaltigerer Übergangsbrennstoff in Schwellenländern
- LPG als Kraftstoff in ausgewählten Märkten
  - wirtschaftlicher Vorteil abhängig von fiskalischen Anreizen
  - weniger THG, aber kaum noch Luftqualitätsvorteil

more info:

www.shell.de/lpgstudie

www.shell.de/publikationen