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GreenShipping Niedersachsen

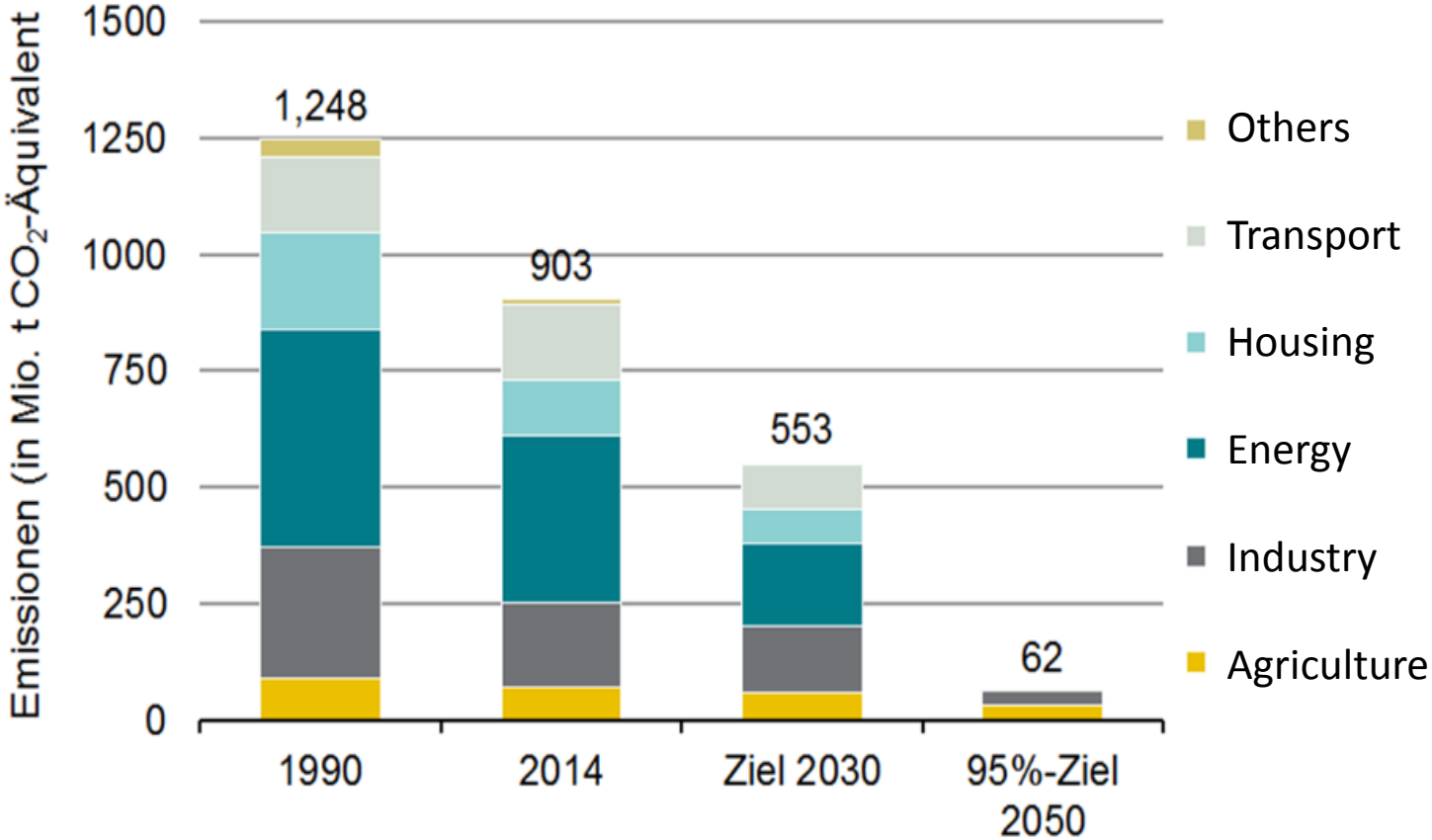
Workshop „Alternative Kraftstoffe II“

7. und 8. November 2018 Leer/Hamburg

STATUS AND PERSPECTIVES OF LIQUID ENERGY SOURCES IN THE ENERGY TRANSITION

Matthias Plötzke / MEW Berlin

Perspectives of Liquid Energy Sources



Base line 1990: 1250 mill t
- 60%-scenario: 500 mill t
- 80%-scenario: 250 mill t
- 95%-scenario: 61 mill

Source: Frontier Economics 2018

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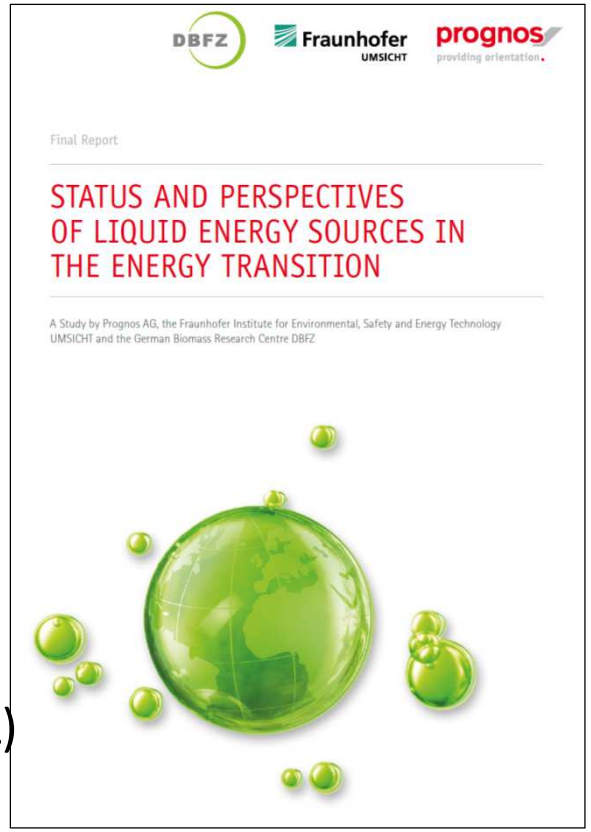

Motivation

- GHG reduction most popular on policy agenda
- long-term interest of the fuels industry
- other studies (BDI)

PtX-Study by Prognos

- published on 7 June 2018
- comparison from user's perspective (e-p. vs PtL)
- role for PtL in case
  - GER follows a 80 % reduction path (Ref: 60%)
  - GER follows a 95 % reduction path (Ref: 60%)
- PtL-PtG-demand in 2050; investment costs, energy import costs, consumer prices …. for the transport and heating sector

Perspectives of Liquid Energy Sources

Auch für den Flug- und Seeschiffsverkehr kommt eine direkte Stromnutzung nach derzeitigem Stand der Diskussion nur sehr eingeschränkt infrage. Sie benötigen deshalb klimaneutrale synthetische Kraftstoffe.

Antw.d.BR: 19/3662: S.8: „[…] *Grundsätzlich liegt für die Schifffahrt, besonders für den internationalen Seeverkehr, ein Fokus auf strombasierten Kraftstoffen […].“*

Wird der internationale Verkehr in die THG-Minderungsziele einbezogen, muss auch hier eine Umstellung auf PtG/PtL-Kraftstoffe erfolgen.

Neben dem Straßengüterverkehr wird die Nachfrage nach synthetischen Kraftstoffen vor allem in der Schifffahrt und der Luftfahrt steigen.

Vor allem in Teilen des **Verkehrssektors** (z. B. Flugverkehr, Schifffahrt, Straßengüterfernverkehr) sowie in der **chemischen Industrie** sind flüssige Energieträger und Rohstoffe **nicht oder nur schwer zu ersetzen.**

AUCH FÜR EMISSIONSFREIE BINNEN- UND SEESCHIFFFAH
SYNTHETISCHE KRAFTSTOFFE ERFORDERLICH

Regenerativ erzeugte Kraftstoffe werden zunehmend für den Verkehr genutzt. Luft- und Schiffsverkehr können perspektivisch nur durch regenerativ erzeugte Kraftstoffe aus der Abhängigkeit von fossilen Kraftstoffen befreit werden. Da das Biomassepotenzial begrenzt ist, könnte der überwiegende Teil dieser Kraftstoffe auf der Basis von regenerativ

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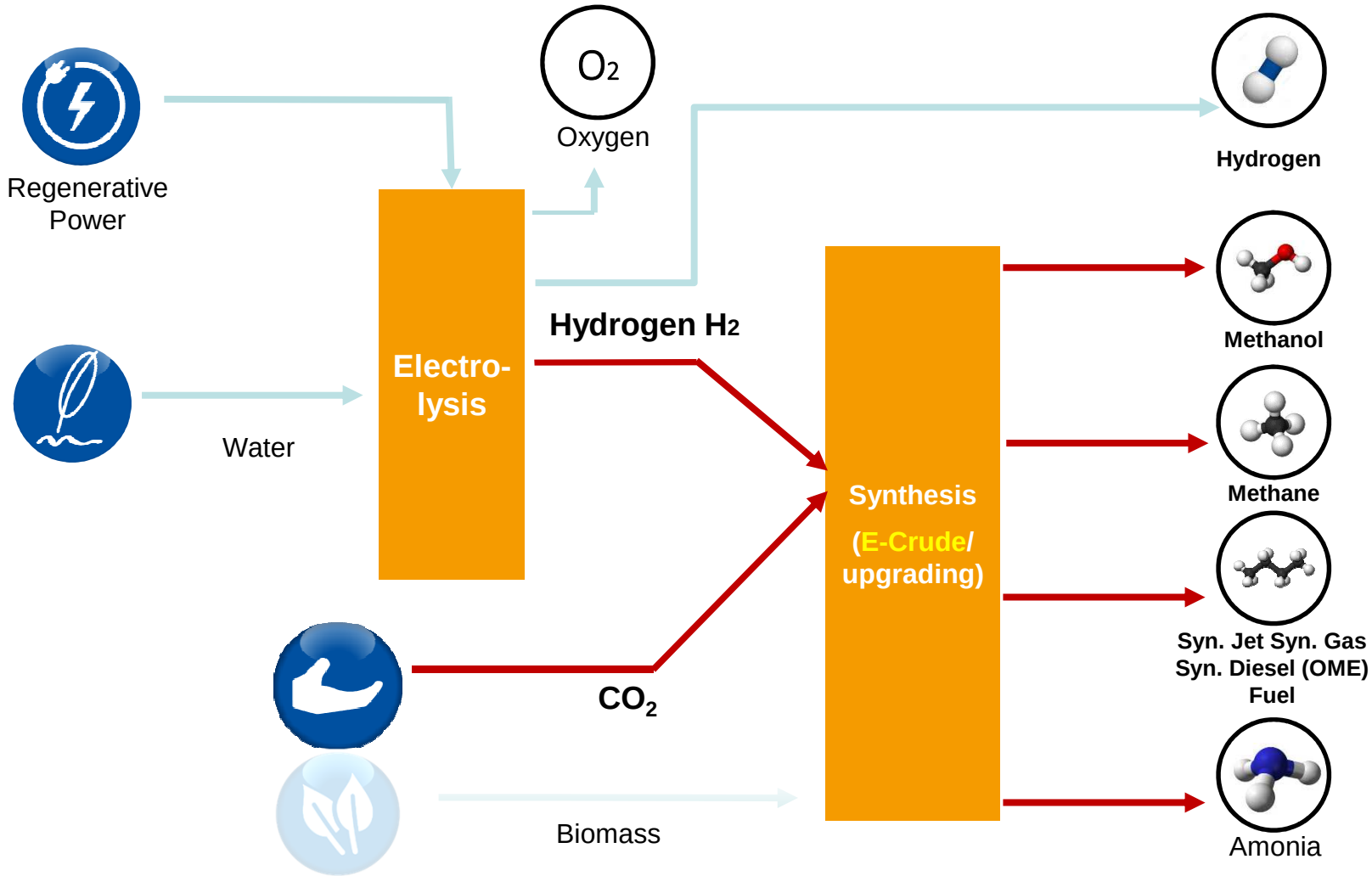
replace fossil hydrocarbon chains by synthetic hydrocarbon chains (H and C)



Source: innogy, fuels workshop Feb 2018

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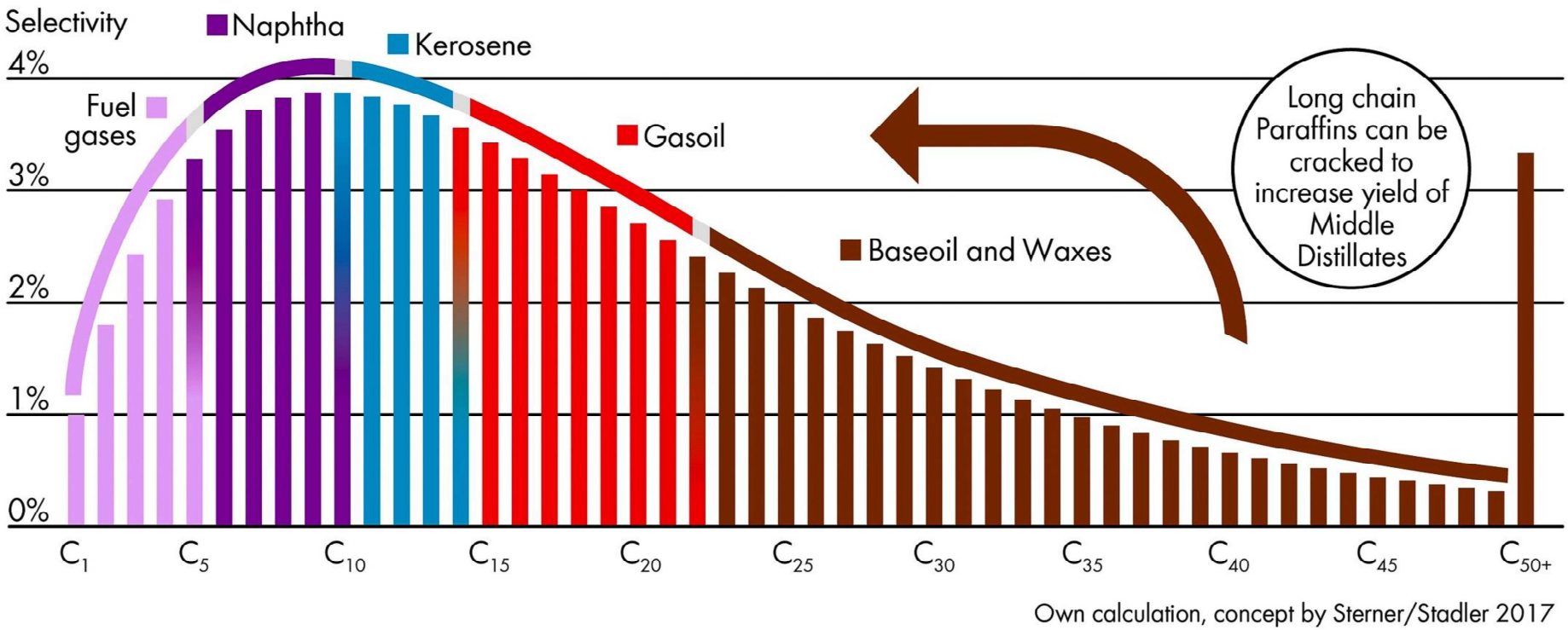
E - Crude: Fischer Tropsch product range



Source: Shell International

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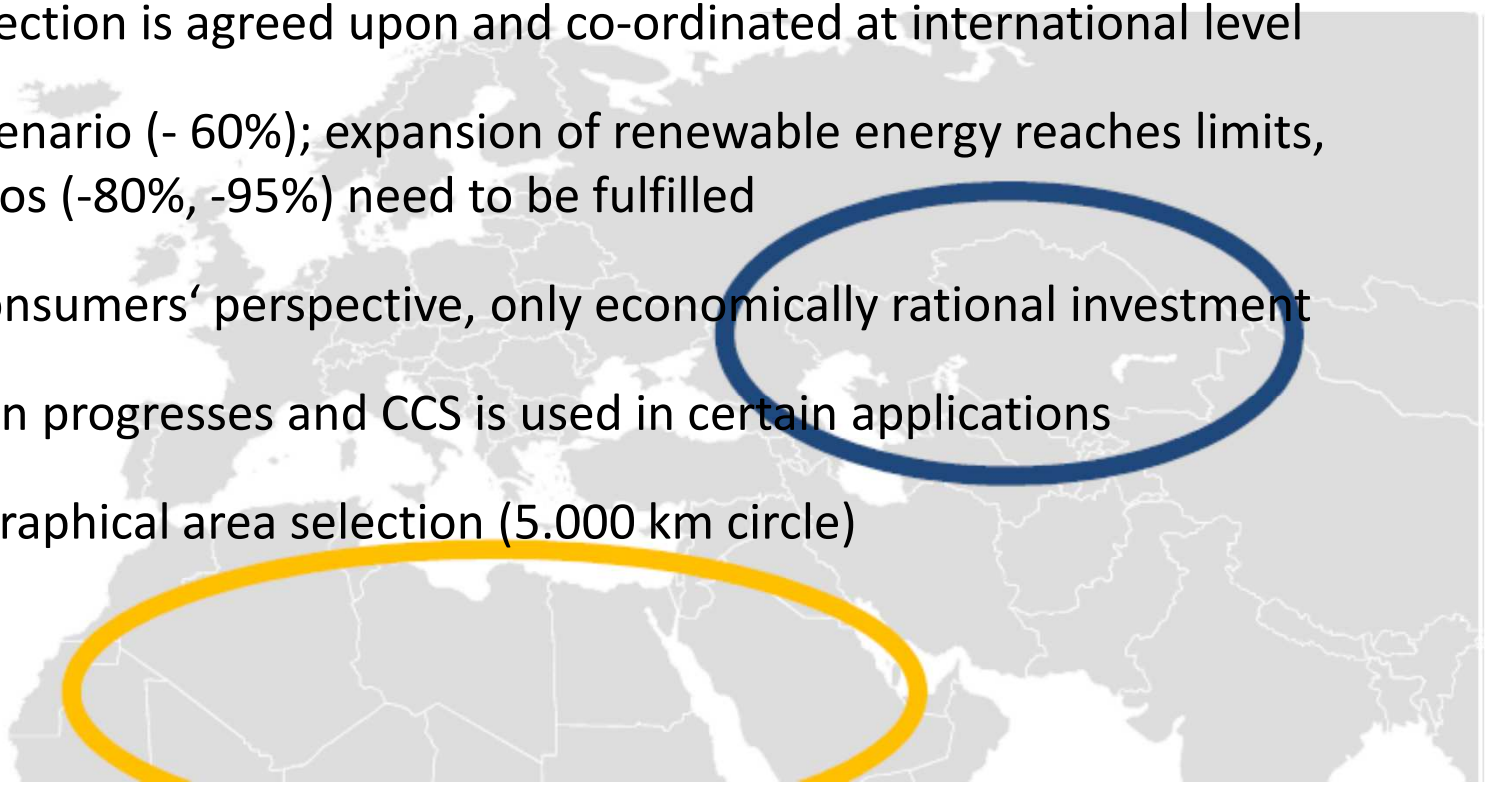
Some basic assumptions of the study

- model data: energy consumption, prices, economic growth, population, efficiency improvements
- stable political and economical framework conditions, no shocks
- climate protection is agreed upon and co-ordinated at international level
- reference scenario (- 60%); expansion of renewable energy reaches limits, both scenarios (-80%, -95%) need to be fulfilled
- individual consumers‘ perspective, only economically rational investment
- electrification progresses and CCS is used in certain applications
- limited geographical area selection (5.000 km circle)



Source: Prognos

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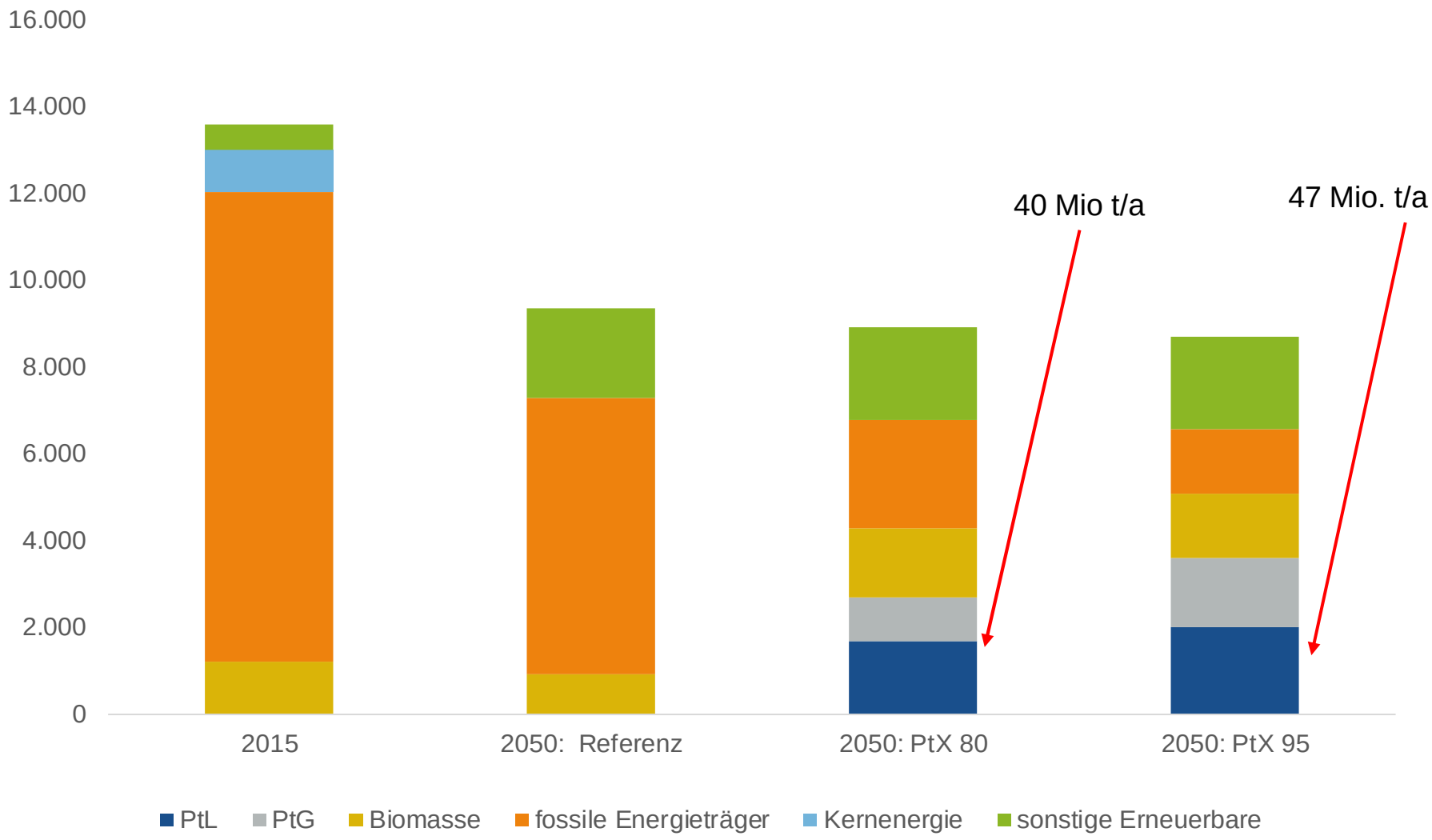
Primary energy consumption in PJ from different sources in resp. scenarios



Quelle: Prognos

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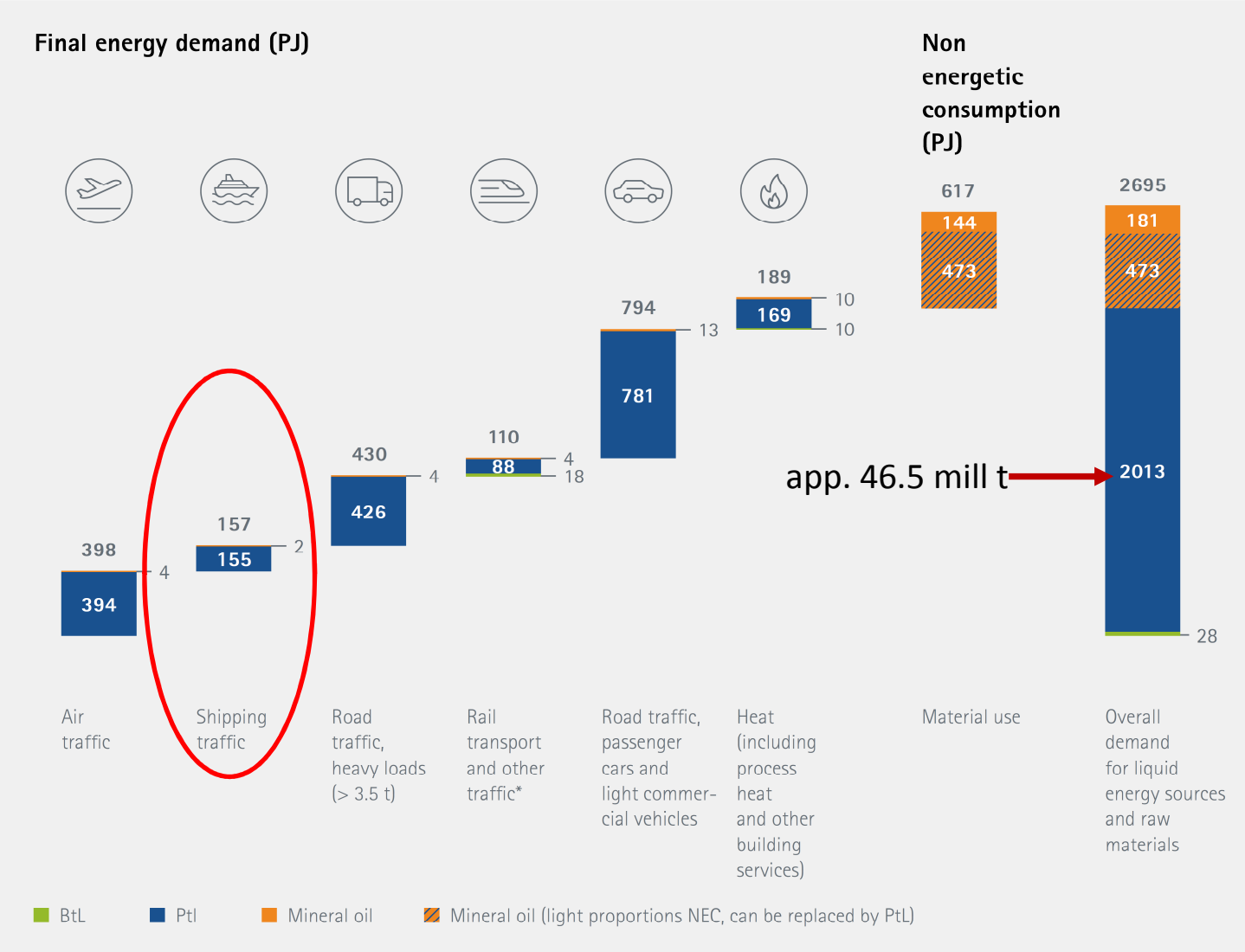
Use of liquid energy in GER in 2050, szenario PtX 95%



Source: researcher's own diagram, *agriculture, construction, public administration, military, NEC: non-energy consumption

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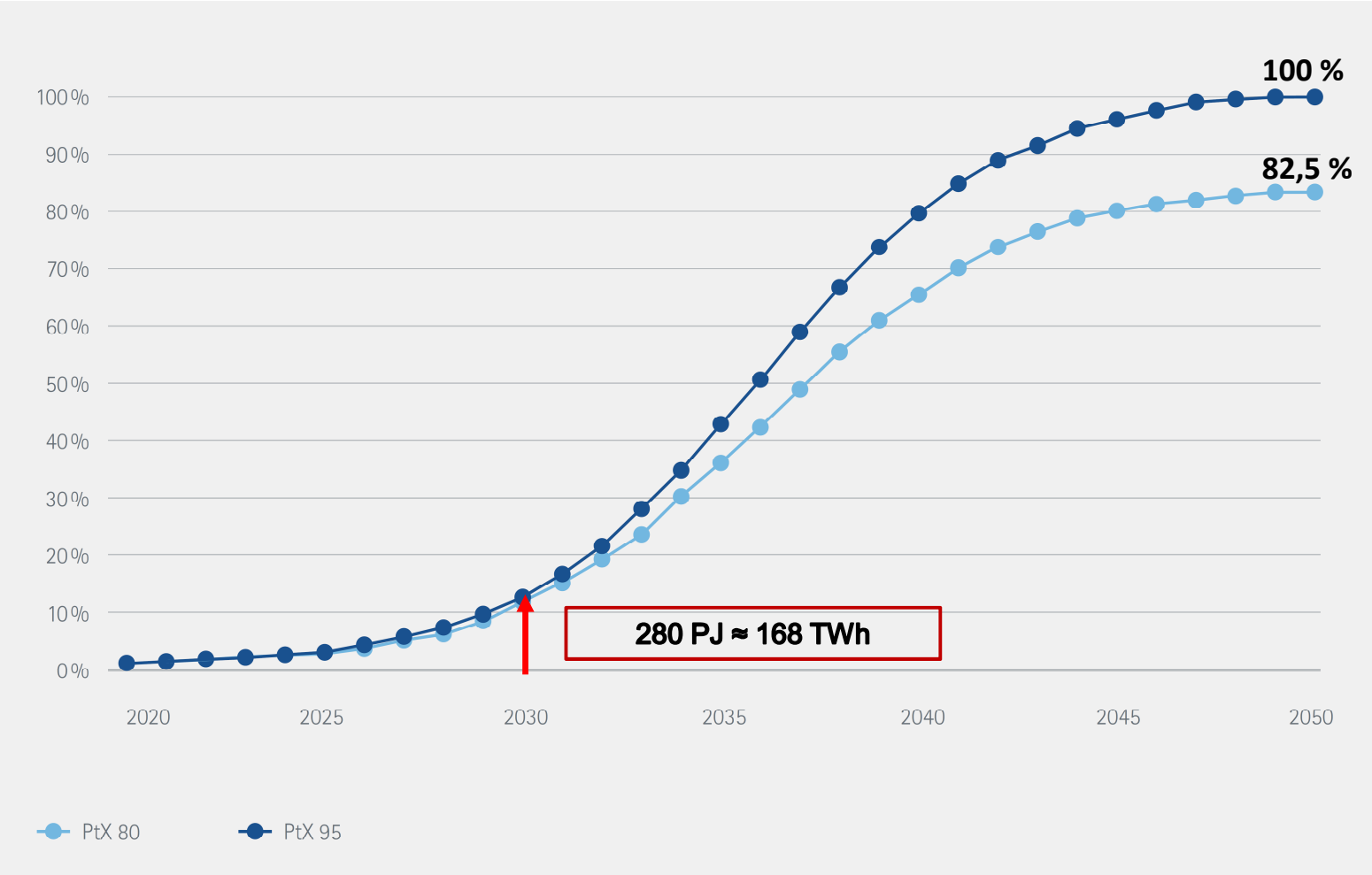
Blending shares for sythetic energy sources in 80% and 95% scenario



Note: These blending proportions were applied for oil and gas

Souce: Prognos

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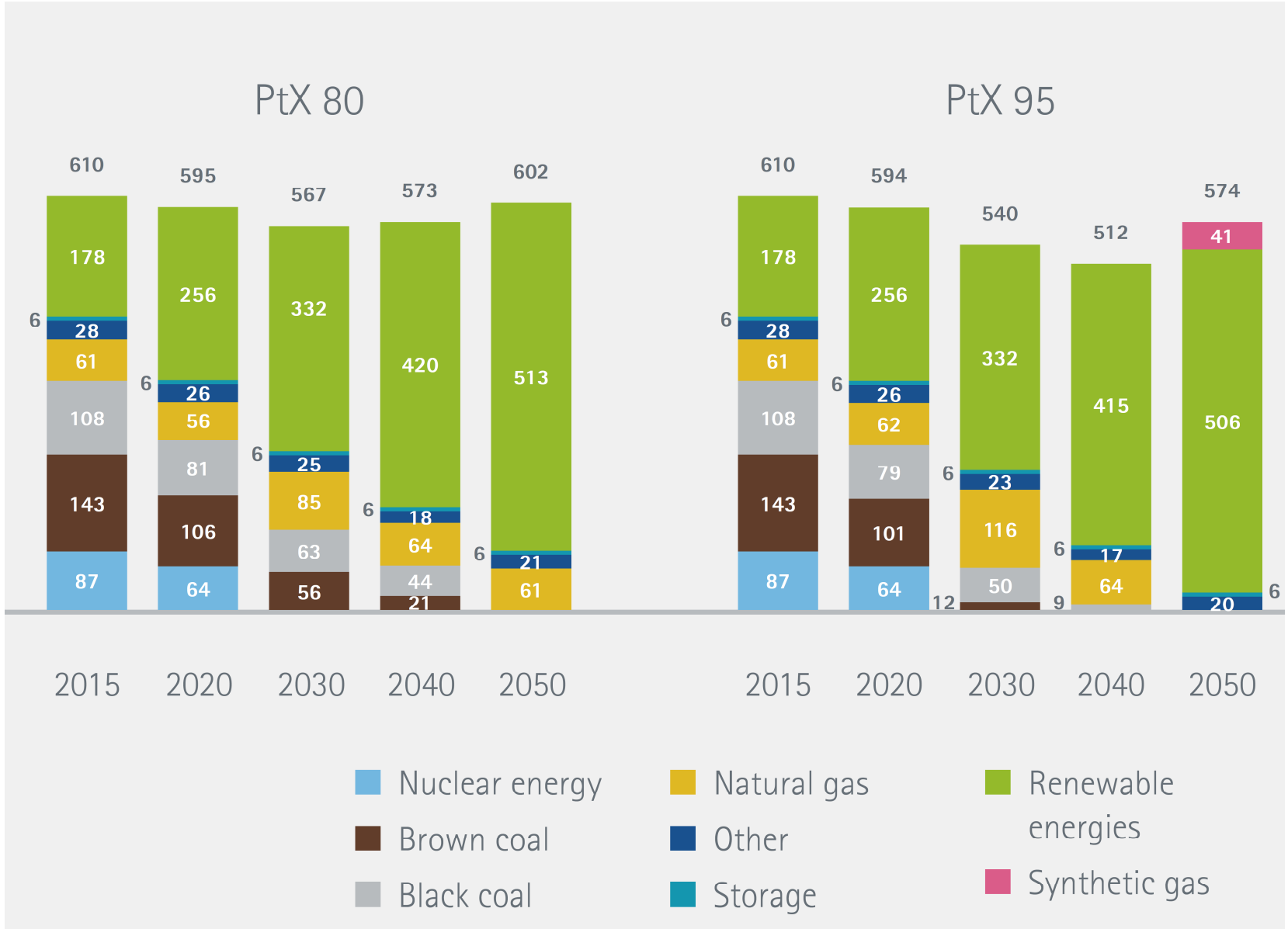

Source: Prognos

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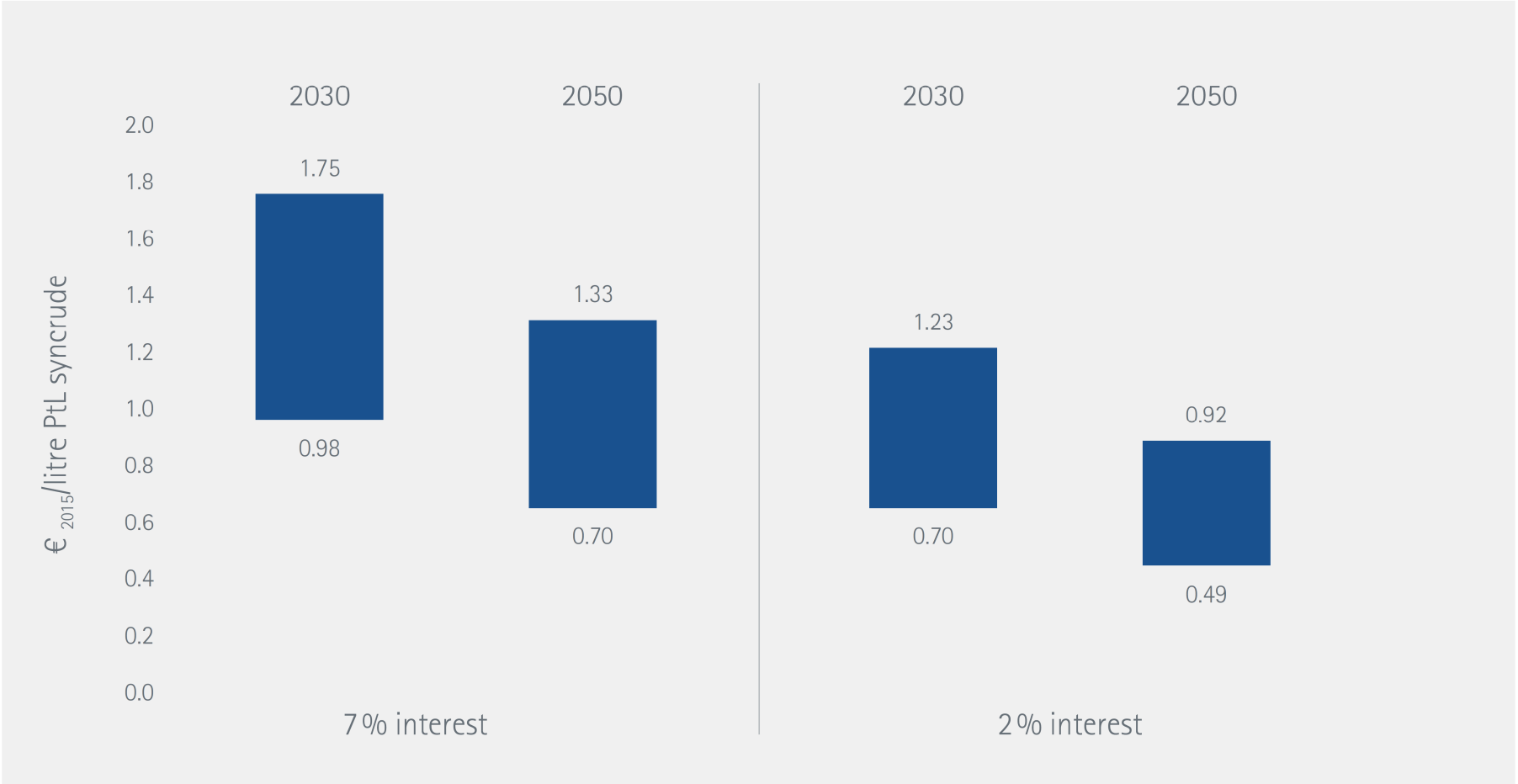
Range of production cost of PtL, FT-procedure



Source: UMSICHT (electricity costs: Prognos)

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Estimated investments resulting from German PtX demand abroad by scenario, cumulated until 2050

	Szcenario PtX 80		Szcenario PtX 95	
	Estimated investments in billion €	Share	Estimated investments in billion €	Share
Wind and solar parks	860	60 %	1,130	61 %
Electrolysis	380	26 %	470	26 %
CO2-Capture	130	9 %	160	9 %
Synthesis plants	50	3 %	60	3 %
Seawater desalination	< 1	< 1 %	< 1	< 1 %
Storage facilities	16	1 %	20	1 %
Total	**1,440**	**100 %**	**1,840**	**100 %**

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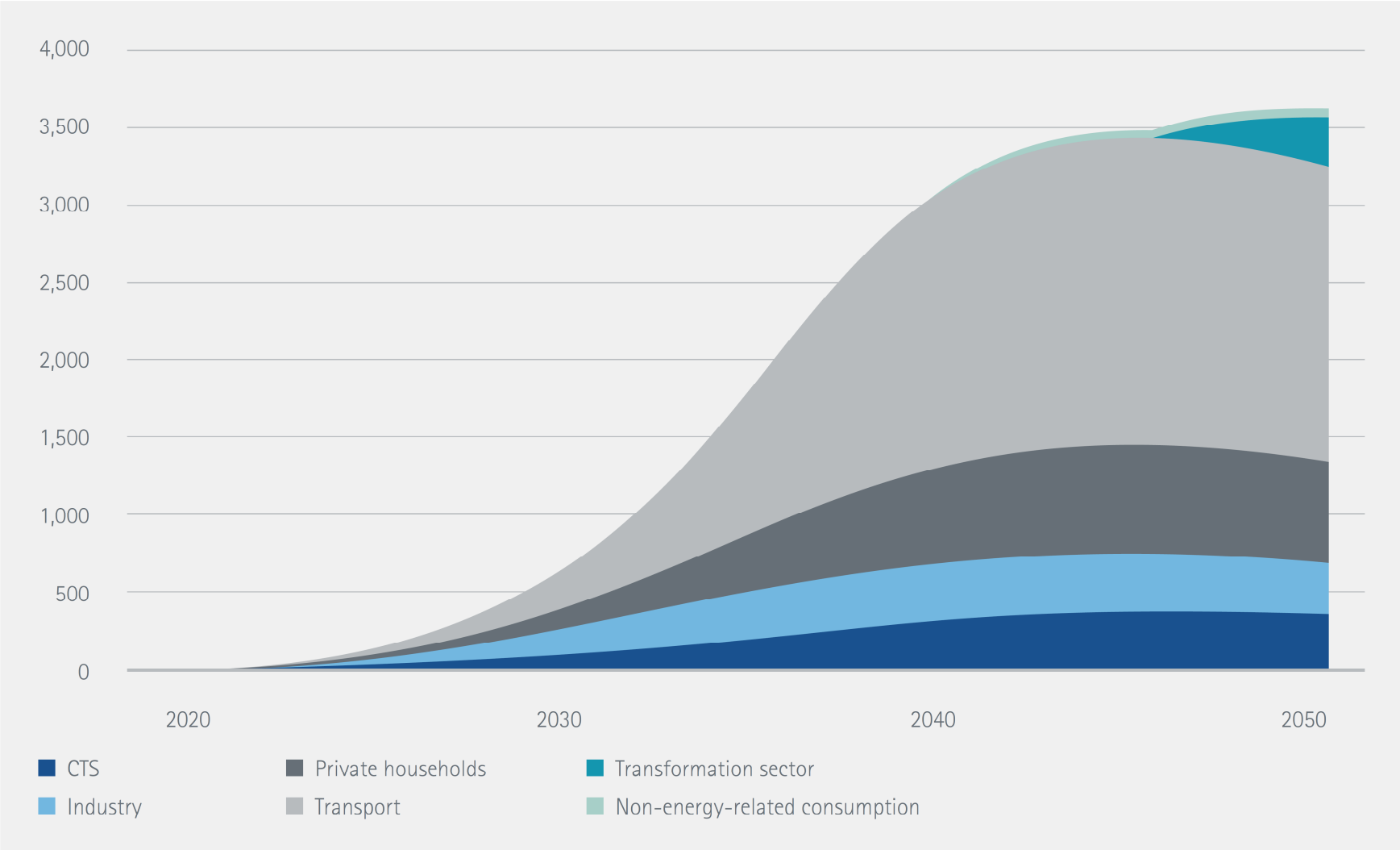
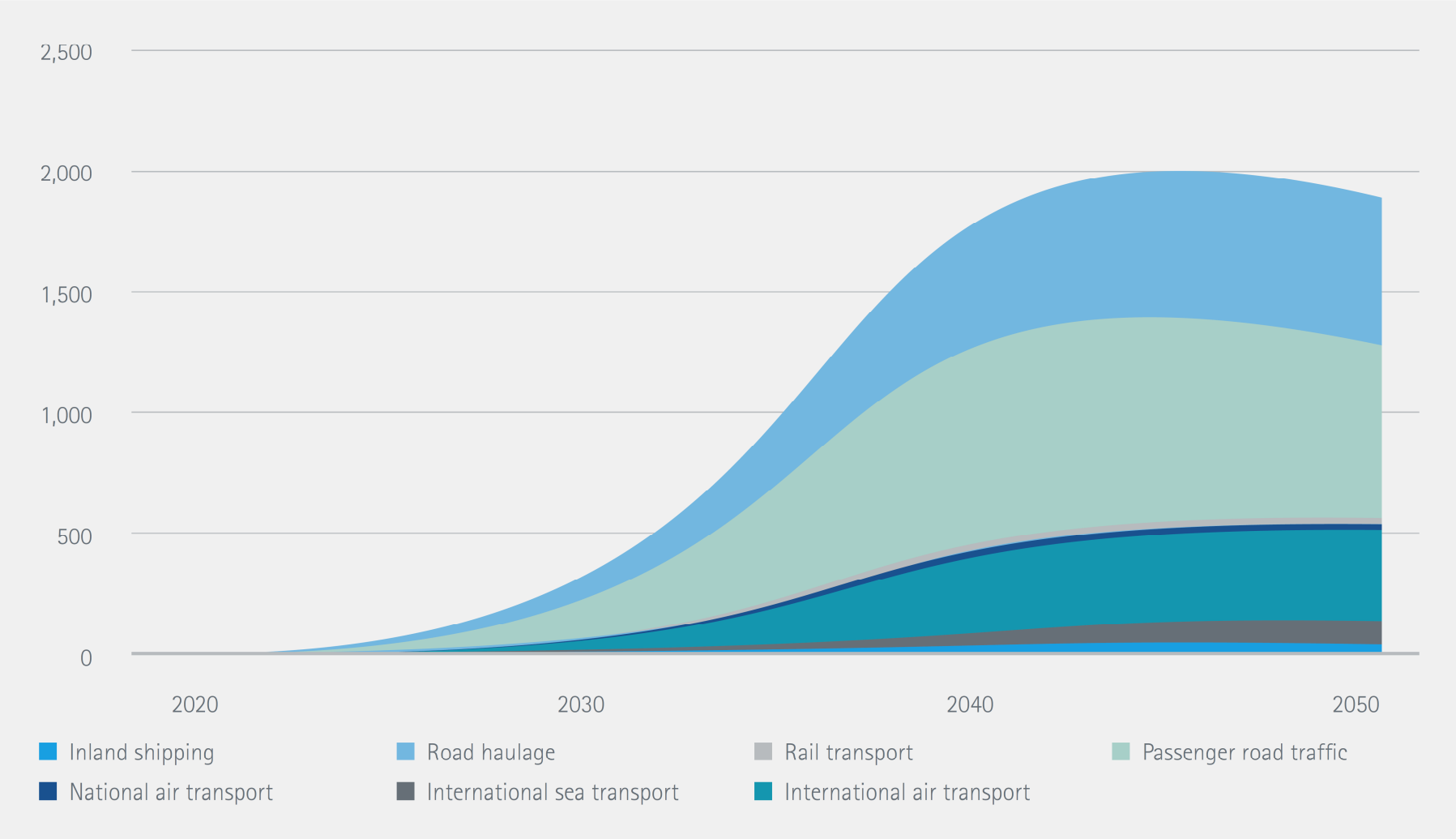
95%-scenario - use of synthetic energy sources from 2020–2050 by sector, in PJ



Source: Prognos AG

Perspectives of Liquid Energy Sources

95%-scenario - use of synthetic energy sources from 2020–2050 by transport mode, in PJ



Source: Prognos AG

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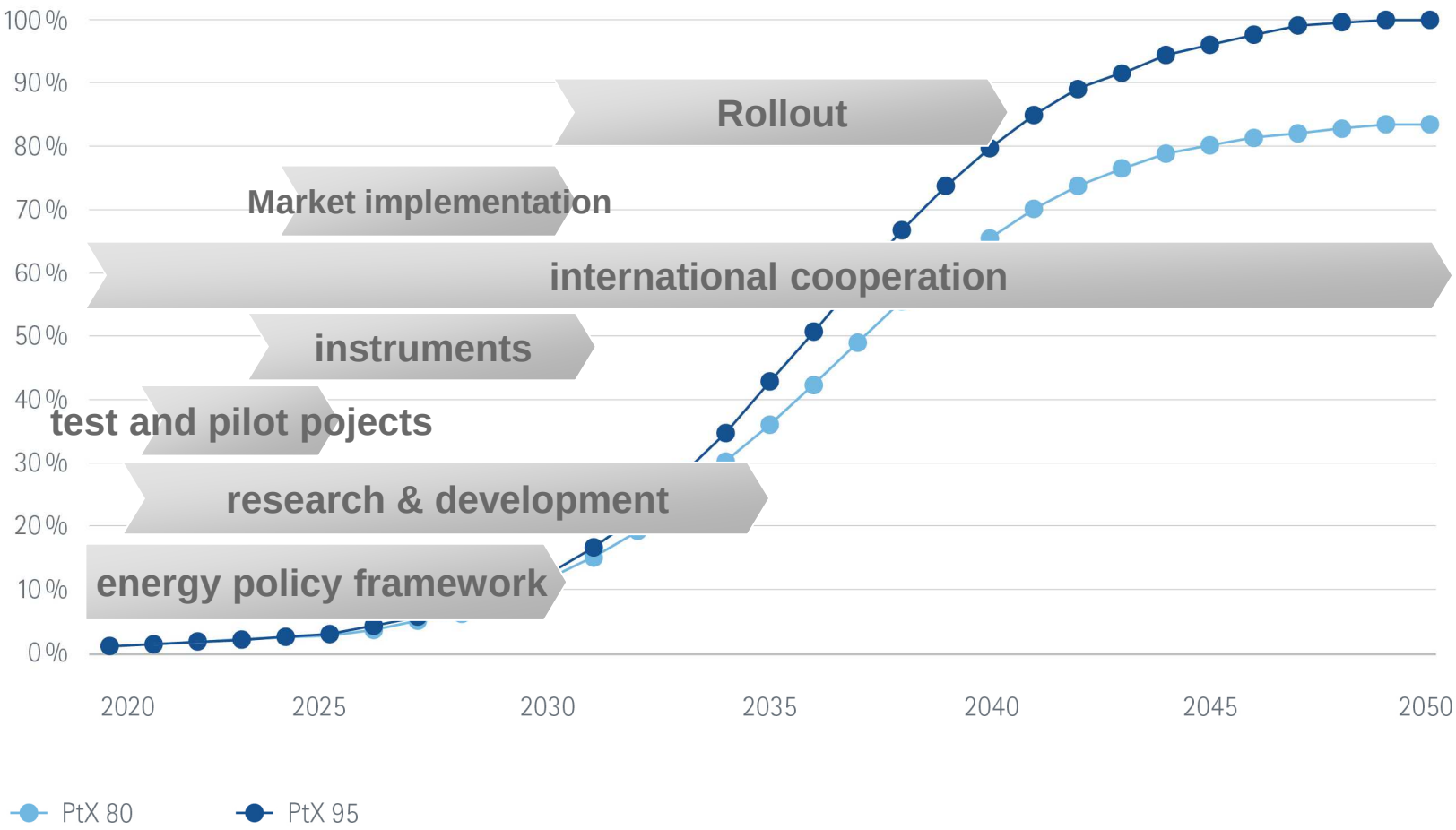
Possible phases for a market uptake



Source: Prognos

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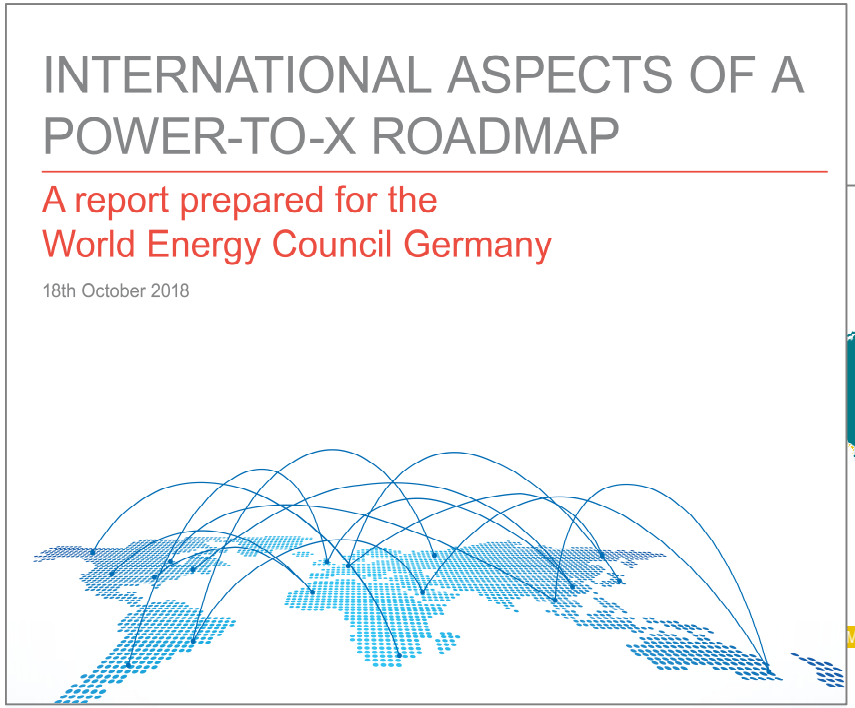
Key results

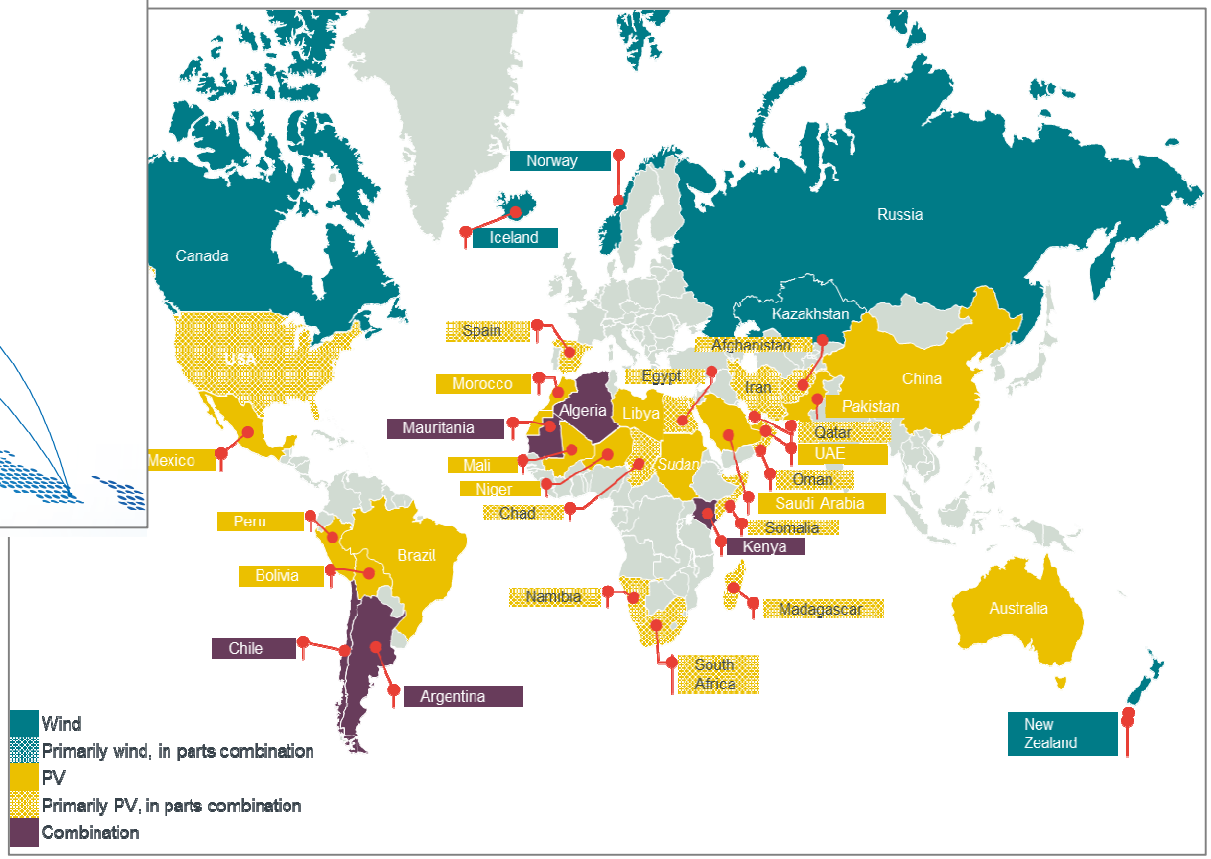
- liquid fuels hardly to replace in certain parts -> „no-regret“ measure; competition otherwise
- cost range of 0,70 – 1,30 € per litre expected (7% disc./ location decisive)
- 2050 PtL demand approx. 40 mill t (-80%) and 47 mill t (-95%)
- Cumulated investment cost beyond reference scenario: +1.500 bill. €

Marketing

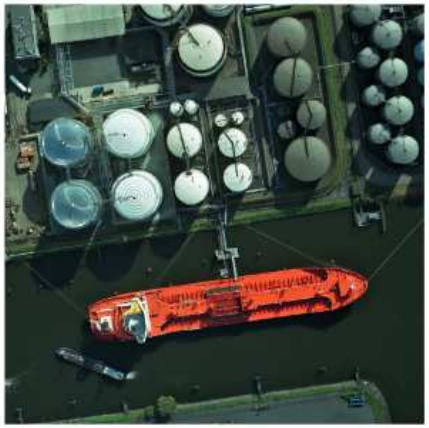
- Stakeholder presentation on 7 June 2018
- discussions with German Federal Ministries and Parliament (e.g. CO2-standards for passenger cars)
- selected regional events at industry locations
- Brussels event with all sponsors (in progress)
- international context (e.g. IMO)

Next steps





Quelle: Frontier Economics.

Thank you

Matthias Plötzke
Fuels policy and Climate Protections
direct: +49 30 80 950 4542
ploetzke@mew-verband.de