

Fuel Cell Trucks in Switzerland - Closing the TCO Gap -

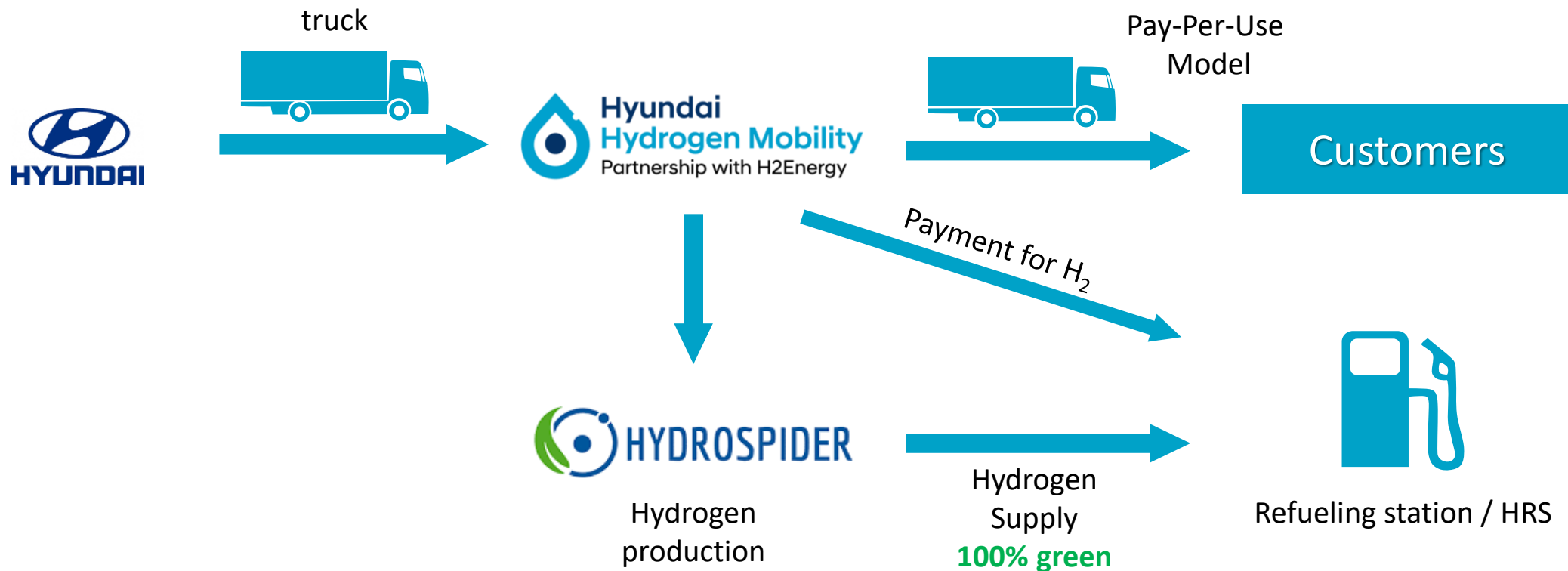
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Company set-up in Switzerland

- Fuel cell technology offers the perfect entry point for HMC being a core technology for HMC
- Set up in CH to solve the chicken-egg discussion
- First vehicle in the country / 50 by end of 2020 / 1'600 by end of 2025





Securing Hydrogen Supply

- Hydrogen availability
- Hydrogen quality assurance
- Price connection to petrol price
- Exclusive supplier for HHM
- Data/forecast information to HS



HydroSpider

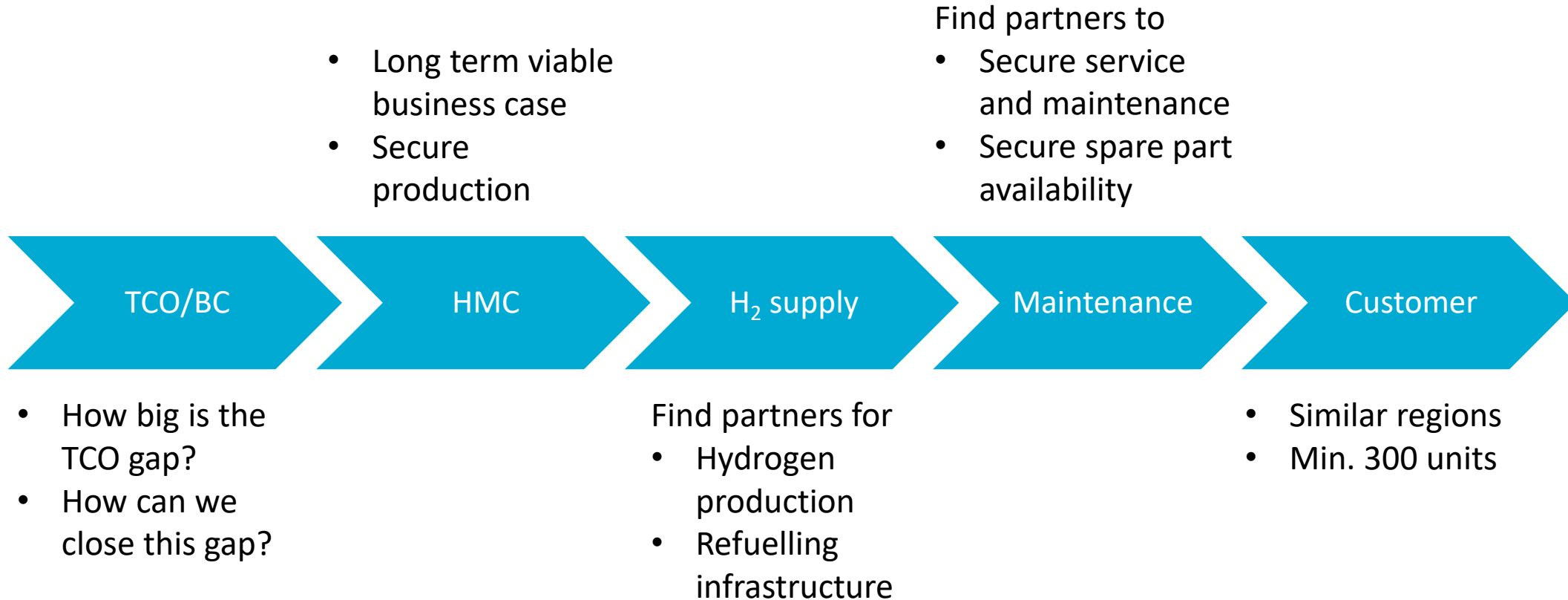


- Quality of the hydrogen
- Availability of hydrogen
- Price calculation
- Certification / Audit

- Hydrogen price
- Hydrogen quality assurance
- Hydrogen availability
- Logistic process

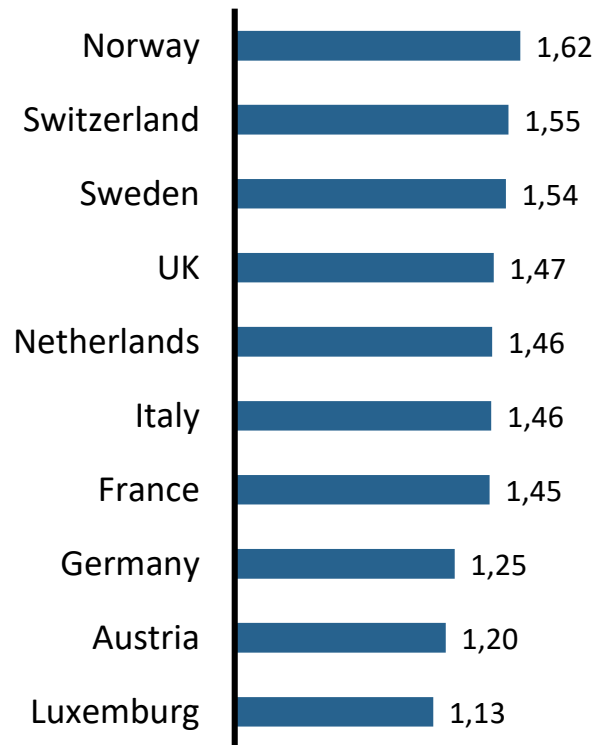


Approaching New Markets



Higher TCO gap in other European countries

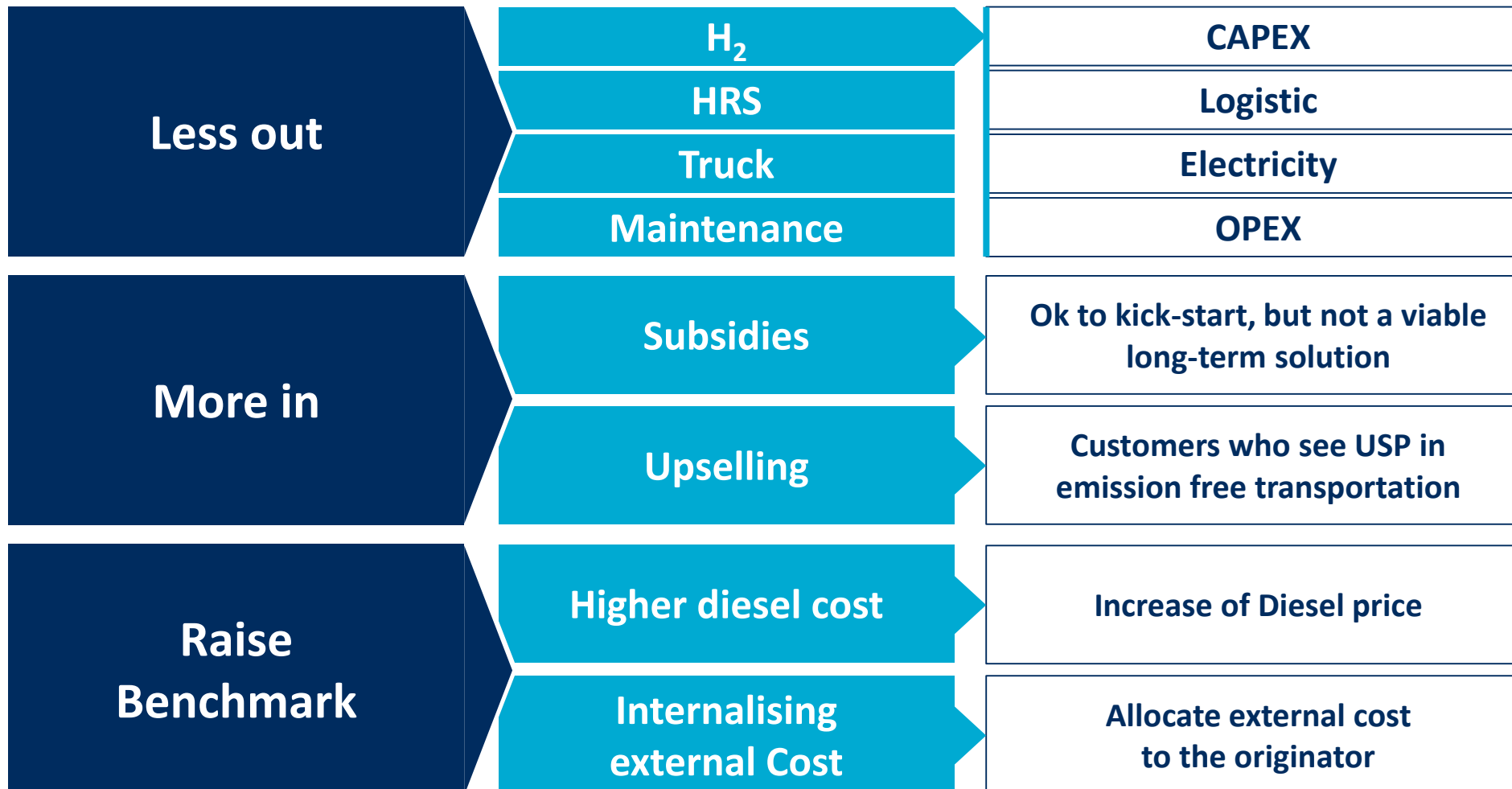
Massive difference in diesel Price



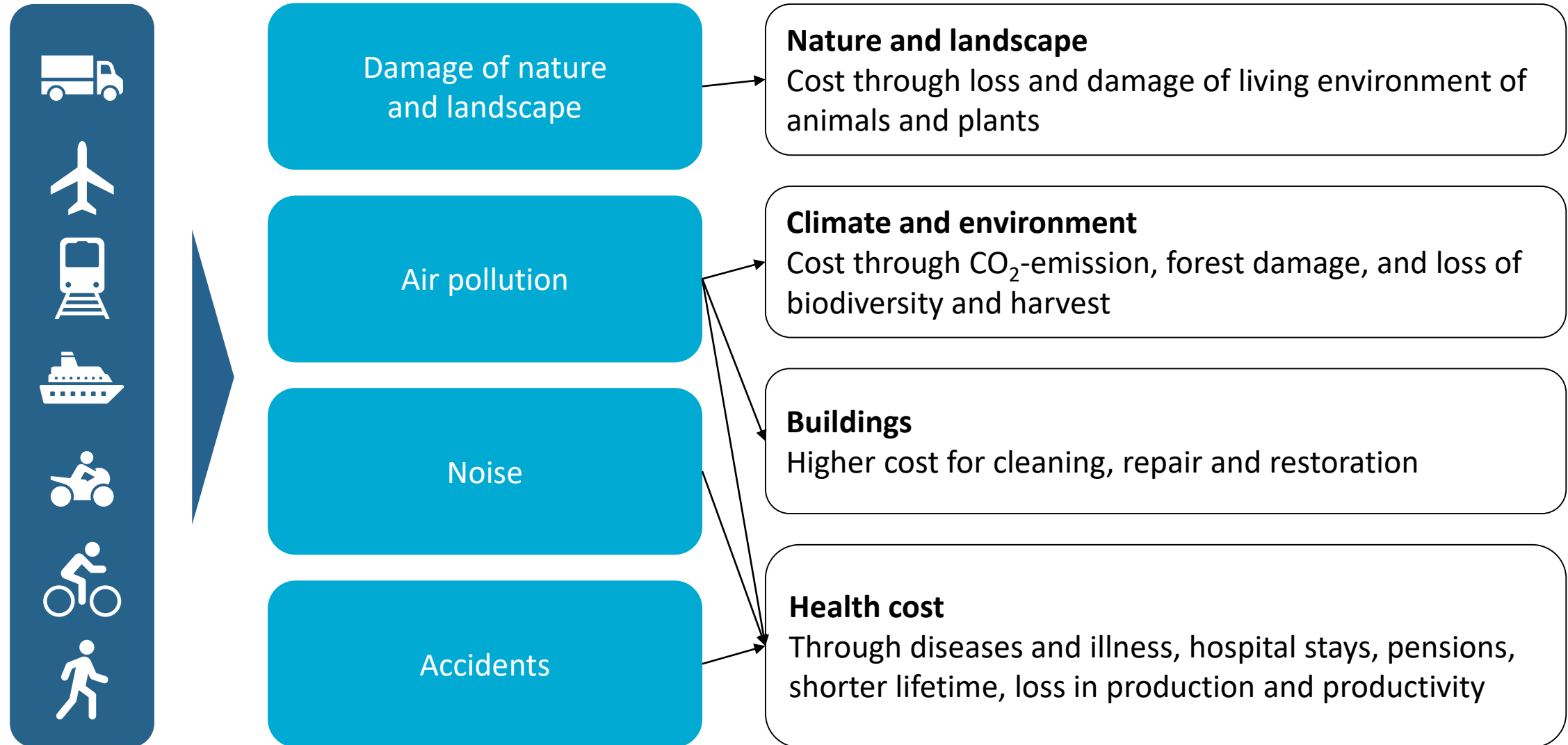
CO₂ tax in Switzerland

- Road tax for heavy duty transportation was established already two decades ago
- Depending on km per year and vehicle weight
- Emission free vehicles are exempted from this regulation
- So Switzerland has already a CO₂ tax benefit for ZEV
- Adds up to about 65'000 CHF per year

TCO gap – how can we close it?




External Cost of Traffic



Potential for cost reduction through H₂ Trucks

External cost of heavy duty traffic, Switzerland, 2016

<i>in mil. CHF</i>	Diesel	H₂	
Air pollution	634	5%	 <ul style="list-style-type: none"> • Diesel truck triggers external costs of approx. 270'000 CHF per year (34to truck with 80'000km pa) • LSVA (Maut)-compensation of just 62'000 CHF p.a. • H₂ truck with approx. 140'000 CHF less external cost p.a.
Noise	573	50%	
Climate	206	5%	
Nature and landscape	116	100%	
Upstream/downstream processes	142	50%	
Accidents	99	100%	
Traffic congestion cost	466	100%	
Miscellaneous	63	100%	
Total	2'299	50%	

Levers for economic viability closing the TCO gap

Sector coupling

Combination of interests from different sectors to change economical situation in a positive and sustainable direction

Marketing and 'Up-selling'

Identification and re-marketing of added value and USP of emission free transport

Cost reduction

Improvements in technology and efficiency as well as utilisation of economies of scale

Politics

Assignment of external cost to originators through long-term and reliable incentives – **not** through scattered government grants and funding

