Sustainable urban freight and logistics
Challenges, policy framework and practical solutions

Germany – China – Republic of Korea

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Dr. Christoph Nedopil
Speaker: Dr. Christoph Nedopil

Professional experience

• Project Director, GIZ (China)
• Founder/CEO SHÄRE GmbH (Germany)
• Founder/CEO YOUSE GmbH (Germany)
• Expert, IFC/World Bank (Washington)
• Policy Advisor, Government of Rwanda (Rwanda)
• Research Assistant, IMD (Switzerland)

Education

• MPA, Harvard Kennedy School
• PhD Economics, TU Berlin
• MSc Engineering, TU Berlin
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

- German federal enterprise
- Operates in Germany and in more than 130 countries
- Promoting international cooperation for sustainable development and international education work

Volume of commissions of more than 2.1 bn Euro

More than 300 public and private sector clients in Germany and abroad

More than 17,300 staff across the globe

- 69% National Personnel
- 18% Staff in Germany
- 13% Seconded Personnel
Development and challenges in the CEP sectors in China and Germany
The CEP sector is growing in Germany … 飞速增长的快递行业

Source: www.biekg.de
Express delivery and E-commerce—Continue growing at breathtaking pace in China

Development of express deliveries and e-commerce in China (in 100 Mio. Shipments)

Source: http://www.chyxx.com/industry/201712/595031.html

60% CAGR e-commerce
...The gap is widening between Germany and China

- While in 2009 online sales in Germany (EUR 21 billion) and China (EUR 33 billion) were nearly the same, the difference between the two countries grew to around EUR 500 billion by 2017, which is equivalent to a 90% growth in China.

- By 2022, electronic commerce in China is expected to be greater than the total of the US, UK, Japan, Germany and France.

Most deliveries are taking place inter city – at the highest growth rates

- 40 bn shipments in total in 2017
- 28% increase in comparison to 2016
- Business segment “Inter city” with a share of 75=4.8% and an increase of 28.09%
Main players in the CEP market in Germany and China

**GERMANY**: DHL is leading the CEP delivery service

**CHINA**: the urban logistics sector in Chinese is divided among several players

Source: www.biek.de

Source: http://www.sohu.com/a/197872620_617173
Biggest market challenges within the CEP sector
快递行业面临的挑战

- The demand for CEP delivery is growing tremendously, entailing significant demand for urban freight transport.

- Most of the pickups and deliveries by CEP services take place in urban agglomerations on the last mile.

- Growing population densities, lack of space and increasing environmental standards are becoming a critical factor for both, customer satisfaction and costs.

- Growing regulatory oversight and push for CO2-savings
The changing regulatory framework for CEP in China and Germany
China and Germany’s regulation for CEP

Germany:

According to the EU White Paper on Transport, major urban centers should achieve **CO2-free city logistics by 2030**, providing infrastructure for charging and refueling of “new energy vehicles”

China:

1. On March 27, 2017, the State Council issued a regulation on express delivery in China, which entered into force on May 1, 2018. The regulation is supposed to optimize the growth of express deliveries in China. Focus is on digitalizing CEP service providers and providing better services.

2. Five-year plans
Transport sector has to be GHG-neutral 2050

Development of GHG emission in Germany until 2050

Target of the German government: -40% compared to 1990

Climate Action Plan 2050 – transport 2030: -40-42% compared to 1990

Requirement of Paris agreement

Target of the German Government: Reduction of GHG emissions compared to 1990 by ...

60 million t CO₂ equivalents: non-avoidable

Transport (direct emissions, w/o international traffic)

Sources: UBA; calculation by INFRAS.

* UBA publication „Germany in 2050 – a greenhouse gas-neutral country“: Non-avoidable emissions from agriculture and industry.
Ambitious GHG emission target requires transition of the transport sector as well as of the energy supply of transport

Reduction of GHG emissions (basis: 1990)

- GHG mitigation goals above 60% can be only reached with an energy transition in the transport sector. 超过60%的减排目标只能通过能源转型实现
- For reducing costs of energy transition a transport transition with avoiding, shifting and improving of traffic is needed. 为了降低能源转型的成本，交通转型也是十分必要的

Transition of transport system

-40% bis -60%

Avoid 避免 + Shift转移 + Improve 改善

Transition of the energy supply of transport

-95%

Alternative fuels + propulsion technologies

可替代燃料+驱动技术
Transportation in China`s 13th Five-Year Plan

- In March 2016, China released its 13th Five-Year Plan for Economic and Social Development of the People`s Republic of China 2016-2020. For the first time in the history of Five-Year plans Low Carbon Transport has been specifically mentioned.

- The main tasks for the transport sector are to promote a low carbon and „intelligent“ development and to further improve modern comprehensive transportation systems, which support the three major national strategies:
  - The One Belt One Road Initiative
  - The Beijing-Tianjin-Hebei Integration Initiative
  - The Yangtze Economic Belt Initiative
Key targets for Transportation in China

The key targets for transportation in the 13th Five-Year Plan for Economic and Social Development of the People’s Republic of China 2016-2020

- **High Speed Railway**
  A total length of 30,000 km, connecting more than 80% of all large cities

- **Expressways**
  Construction or upgrading of around 30,000 km of expressways

- **Civil Airports**
  Construction of at least 50 more civil airports

- **Urban Transportation**
  Approximately 3,000 km of new urban rail transit lines

- **City Cluster Transportation**
  Intercity rail networks for Beijing-Tianjin-Hebei, Yangtze Delta, Pearl River Delta, middle-reach Yangtze, Central Plain, Chengdu-Chongqing region and Shandong Peninsula city clusters

- **Development of Corridors**
  Construction of cross border corridors and main corridors along One Belt One Road

- **Rural Transportation**
  Construction of 1 million km of rural roads to facilitate rural development; interlink all administrative villages via paved roads and shuttle bus services

- **Transportation Hubs**
  Construction of multimodal passenger and freight hubs and city complexes around transportation hubs

- **Intelligent Transportation**
  Internet based operation of transport infrastructure, internet of vehicles and vessels, vehicle automation

- **New Energy Vehicles**
  Cumulative total production and sales of 5 million new energy vehicles

- **Harbor and Shipping Facilities**
  Improvement of port clusters (Bohai sea rim, Yangtze and Pearl river delta) and inland waterways, specialized berths for containers, crude oil and Liquified Natural Gas (LNG)

- **Cycling and Walking**
  Improvement of urban transport facilities for cyclists and pedestrians and promotion of cycling
Main pillars of transport development in China

- **Green and Low Carbon Transportation**: Innovation driven promotion of public transportation, efficiency in transportation, alternative fuels, new energy vehicles, cycling and pedestrian infrastructure and general „green“ technologies in transportation.

- **Interconnected and Multimodal Transportation**: Promotion of multimodal passenger and freight hubs, optimisation of existing transportation hubs and strengthening of interconnectivity of transport infrastructure.

- **Smart Transportation**: Innovation driven promotion of IT- and Big Data based transport management and operation, online ticketing and vehicle and fleet automation.

- **International Transportation Networks**: Promotion of cross border infrastructure development, expansion and improvement of international and domestic airports and ports.

- **Safe Transportation**: Improvement of safety standards and emergency rescue.
Practical solutions for sustainable development of the future CEP sector
E-Trucks in urban freight transport

- Main advantages of e-trucks for urban freight and city logistics purposes are significant **noise and pollutant emission reduction**

- E.g. WORK and WORK L StreetScooter models save around 18,000 t of CO2 per year and per vehicle compared to a diesel truck

- Despite outstanding energy efficiency and vehicle performance as well as tolerable ranges of approx. 160 km (UPS electric van), e-trucks are still relatively **cost intensive** in terms of purchase as and provision of charging infrastructure

- The market offer for electric medium-weight and heavy-duty trucks is still insufficient
Micro-hubs, cargo-bikes for inner-city delivery

In Germany
» 3,000 E-Vehicles and
» 10,000 E-Bikes in daily postal operations

Source: DHL, www.biek.de
Parcel lockers for 24/7 delivery and drop-off

DHL’s “Packstation” operates

> 3,000 lockers with
> 250,000 compartments in
> 1,600 German cities and communities with
> 5 million registered customers
Multi-modal urban logistics – European cities using trams to move cargos

- Germany: CarGo Tram is used in Dresden to move auto parts from VW logistics center to production site along the city’s tram passenger route.

- Switzerland: In Zurich, Cargo-Tram and E-Tram makes 18 round trips every month, with each trip serving one of the 9 pickup points. Cars do not have any access to the 9 stops during their working hours (from 3 pm till 7 pm).

- France: TramFret uses old trams to transport cargo on the city’s network from a warehouse on the outskirts of the city to the busy downtown area in Saint-Etienne Metropole.
Autonomous ground vehicle (AGV) lockers

- As of June 19, 2018, Chinese Alibaba launches package delivery in Beijing with a robot

- German Media Markt tests SMILE together with manufacturer Starship
Cargo Drones

- JD.com
  - tested cargo-drones since 2016
  - Cargo of up to 3 kg
  - Up to 100 regular routes (in Jiangsu, Sichuan, Guanxi)

- DHL has been testing drones („Paketkopter“) since 2013
  - supply island of Juist with medical supplies
  - piloted in severe mountain conditions in Southern Germany
  - Current delivery pilots ongoing in cities
  - DHL has developed special parcel locker for
    - Storing drone
    - Charging drone
    - Loading drone with parcel
Private Parcel Delivery – “Logistics Uber”

- “Amazon Flex”: USA, UK, since 2017 in Berlin
- Drivers get delivery orders per app
- Four-hour delivery slots on six days of the week
- Parcels delivered from pick-up point to recipient
- Only booked hours paid; no compensation for extra hours
Intermodal Long-haul transport

### Specific CO₂-Emissions in g/km for train, ships and truck, 2010

- Train: 20.3 g/km
- Ships: 33.1 g/km
- Truck: 95.9 g/km

### Specific CO₂-Emissions in percent for train, ships and truck, 2000-2010

- Train: 97.4%
- Ships: 91.1%
- Truck: 91.1%

(ifeu 2011, Datenbank Umwelt & Verkehr)
Combined Transport in Germany

“We want to further strengthen combined transport.”
Germany’s Coalition Agreement for the 19th legislative period 2018-2021

- Funding of private terminals
- Funding of rail sidings
- Increased total weight allowed in combined transport (44 tonnes)
- No driving bans on Sundays and public holidays for pick-up and delivery legs
Combined Transport in China

China’s Outline of the 13th Five-Year Plan for the National Economic and Social Development contains 3 provisions of relevance to intermodal transport:

- Accelerate intermodal transport development and improving transportation service quality and efficiency
- Promote road-rail-water and aviation intermodal transport, and building international logistics channels
- Open-up cross-border traffic corridors for intermodal transportation
## Combined Transport in comparison

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<th>China</th>
<th>Germany</th>
<th>US</th>
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<td>Share of sea-railway intermodal container transport in the hinterland traffic</td>
<td>&lt;2%</td>
<td>40-50%</td>
<td>40%</td>
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<tr>
<td>Share of railway intermodal transport volume in railway freight volume</td>
<td>Approx. 3%</td>
<td>Approx. 35%</td>
<td>30-50%</td>
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Electrification is a key to de-carbonize long-haul transport in China, until the end of 2017, operated:

- > 123,000 NEV in total,
- > 12,000 NEV in the logistics,
- > 10,700 charging points.
Summary

• CEP market is sure to continue to grow quickly, with opportunities and challenges

• Governments in China and Germany are increasingly issuing regulations to make logistics greener and reduce stress on city infrastructure

• Companies can and should innovate to become more efficient, e.g. by making use of new technologies

• Governments and companies should work together to provide efficient, safe and green logistics
Thank you and please contact me should you have any questions!

Dr. Christoph Nedopil
Project Director
Sino-German Cooperation on Low Carbon Transport (CLCT)
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Office: +86 10 8527 5589 ext. 425
Mobile: +86 155 0104 1248
WeChat: cnedopil
E-mail: christoph.nedopil@giz.de

www.sustainabletransport.org