

# Sino-German Cooperation on Low Carbon Transport

Project Brochure



**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

Supported by:



Federal Ministry  
for Economic Affairs  
and Climate Action



INTERNATIONAL  
CLIMATE  
INITIATIVE

on the basis of a decision  
by the German Bundestag

# Imprint

**Published by:**  
Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

**Registered offices:**  
Bonn and Eschborn, Germany

**Address:**  
Tayuan Diplomatic Office Building 2-5  
14 Liangmahe South Street, Chaoyang District  
100600, Beijing, PR China  
T +86-(0)10-8527 5589  
F +86-(0)10-8527 5591

**E** [transition-china@giz.de](mailto:transition-china@giz.de)  
**I** <https://transition-china.org/mobility>

**Project:**  
Sino-German Cooperation on Low Carbon Transport (CLCT)  
CLCT is part of the International Climate Initiative (IKI).  
IKI is working under the leadership of the German  
Federal Ministry for Economic Affairs and Climate  
Action, in close cooperation with its founder, the Federal  
Ministry of Environment and the Federal Foreign Office.

**Authors:**  
Sebastian Ibold, Lei Shen, Xuan Ling, Yun Xia, Gregor  
Bauer, Rabea Schmecht, Xin Hu, Mingshu Yang, Aakash  
Abraham, Xuyang Song

**Layout:**  
Xin Hu, Gregor Bauer, Xuyang Song

**Photo credits/sources:**  
GIZ/Xin Hu (cover)  
Adobe Stock/dmitrymoi (p1)  
GIZ/Sebastian Ibold (p6)  
Adobe Stock/Saklakov (p7)  
Adobe Stock/onlyyouqj (p11)

**Maps:**  
The maps printed here are intended only for information  
purposes and in no way constitute recognition under  
international law of boundaries and territories. GIZ  
accepts no responsibility for these maps being entirely  
up to date, correct or complete. All liability for any  
damage, direct or indirect, resulting from their use is  
excluded.

**URL links:**  
Responsibility for the content of external websites linked  
in this publication always lies with their respective  
publishers.  
GIZ expressly dissociates itself from such content.

Beijing, 2023

# Foreword

Dear reader,

The transport sector, notoriously the “hard nut to crack” in decarbonisation efforts, accounts for about 10% of China’s 10.5 Gt of annual CO<sub>2</sub> emissions, which make China the largest emitter of greenhouse gas emissions globally. China therefore remains an essential player in the fight against global warming and has set ambitious targets for a climate-friendly development pathway.

The Sino-German Cooperation on Low Carbon Transport (CLCT) project supported China’s Ministry of Transport and other partners on this pathway. In cooperation with Chinese and international partners, CLCT conducted a range of research and piloting activities in the transport sector. Particularly noteworthy were developing the first Sustainable Urban Mobility Plan in China, and tools to evaluate the cycling-friendliness of Chinese cities or the climate performance of intermodal freight transport hubs. The project further fostered political dialogues and helped establish platforms such as the Beijing Dialogue and the Active Mobility Alliance to explore the future of mobility domestically and internationally.

This brochure serves as a summary of the activities and impacts of CLCT, and as a compilation of the materials produced in cooperation with Chinese and international project partners. I hope you find this brochure informative about the achievements of this cooperation and encouraging of China’s transport sector development.

As CLCT comes to a close in 2022, we look forward to building upon the work of this project and its partners. Transport continues to play a crucial role in decarbonisation, and it is my hope that the contributions of this cooperation continue to bear fruit in the future.



A handwritten signature in black ink, appearing to read 'T. Giehler', written in a cursive style.

**Thorsten Giehler**  
Regional Director GIZ East Asia

# Table of Contents

## 1 | Introduction to CLCT

## 8 | Policy Briefings

- 8 | Outline for Building China's Strength in Transport
- 9 | National Comprehensive Three-Dimensional Transportation Network Planning Outline
- 9 | NEV Development Plan 2035
- 10 | New Energy Buses in China: Overview on Policies and Impacts
- 10 | Work Plan for Promoting the Development of Multimodal Transport and Optimising and Adjusting the Transport Structure (2021-2025)

## 11 | Reports

- 11 | Towards Zero Emissions: China's Climate Pathway and its Implications for the Transport Sector
- 12 | The Beijing Dialogue: Future Urban Transport & Mobility in Beijing
- 13 | CRTEM/HBEFA China Road Transport Emission Model
- 14 | Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan (2nd Edition – CN Translation)
- 15 | Sustainable Urban Mobility Plan Foshan Pilot Project
- 16 | Sustainable Urban Mobility Planning (SUMP) in the Chinese Urban Context: Lessons from the SUMP Foshan Pilot Project
- 17 | The Uptake of New Mobility Services: Learnings from Asia

- 18 | From MoD to MaaS: Promoting China's Transition Towards Sustainable Transport Integration
- 19 | Towards a National Active Mobility Strategy and an Indicator System for Active-Mobility Friendly Cities in China
- 20 | Barrier-Free Transport: Overview of Developments in the European Union and Germany
- 21 | Research on Technical Systems of Battery Electric Buses in China
- 22 | Overview on Battery Swapping and Battery-as-a-Service (BaaS) in China
- 23 | A Study on the Optimisation of the Bus Network and Exclusive Bus Lane Planning for the City of Tianjin
- 24 | A Study on the Promotion and Application of New Energy Logistics Vehicles in China
- 25 | Research on the Setting of Temporary Loading/Unloading Zones for New Energy Logistics Vehicles in Chancheng District of Foshan, Guangdong Province, P.R. China
- 26 | Establish and Implement an Evaluation System for Multimodal Freight Transport Hub Management in China
- 27 | Developing Smart Logistics for Sustainable Transport

## 28 | Videos

## 30 | In the Spotlight

# Abbreviations

BaaS	Battery as a Service
BIT	Beijing Institute of Technology
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMUB	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BMWK	German Federal Ministry for Economic Affairs and Climate Action
BTI	Beijing Transport Institute
CATARC	China Automotive Technology and Research Center
CATS	China Academy of Transportation Sciences
CCCPC	Central Committee of the Communist Party of China
CLCT	Sino-German Cooperation on Low Carbon Transport
CRTEM	China Road Transport Emission Model
CSTC	China Sustainable Transportation Center
CUSTReC	China Urban Sustainable Transport Research Center
DGG	Deutsche GVZ-Gesellschaft mbH
Foshan TB	Foshan Transport Bureau
Foshan TC	Foshan Transport Management Company
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
HBEFA	Handbook Emission Factors for Road Transport
ICV	Intelligent Connected Vehicle
IKI	International Climate Initiative
MaaS	Mobility-as-a-Service
MEE	China's Ministry of Ecology and Environment
MFTH	Multimodal Freight Transport Hub
MIIT	Ministry of Industry and Information Technology of the People's Republic of China
MKS	Sino-German Cooperation on Mobility and Fuels Strategy (MFS) as a Contribution to the Mobility and Transport Transition
MoD	Mobility-on-Demand
MoT	Ministry of Transport of the People's Republic of China
NDC-TIA	NDC Transport Initiative for Asia
NEB	New Energy Bus
NELV	New Energy Logistics Vehicle
NEV	New Energy Vehicle
NICTP	Nanjing Institute of City and Transport Planning
NMS	New Mobility Services
RIOH	Research Institute of Highway
SULP	Sustainable Urban Logistics Plan
SUMP	Sustainable Urban Mobility Plan
SUTPC	Shenzhen Urban Transport Planning Center Co., LTD
TMEDI	Tianjin Municipal Engineering Design & Research Institute
TPRI	Transport Planning and Research Institute



## SINO-GERMAN COOPERATION ON LOW CARBON TRANSPORT

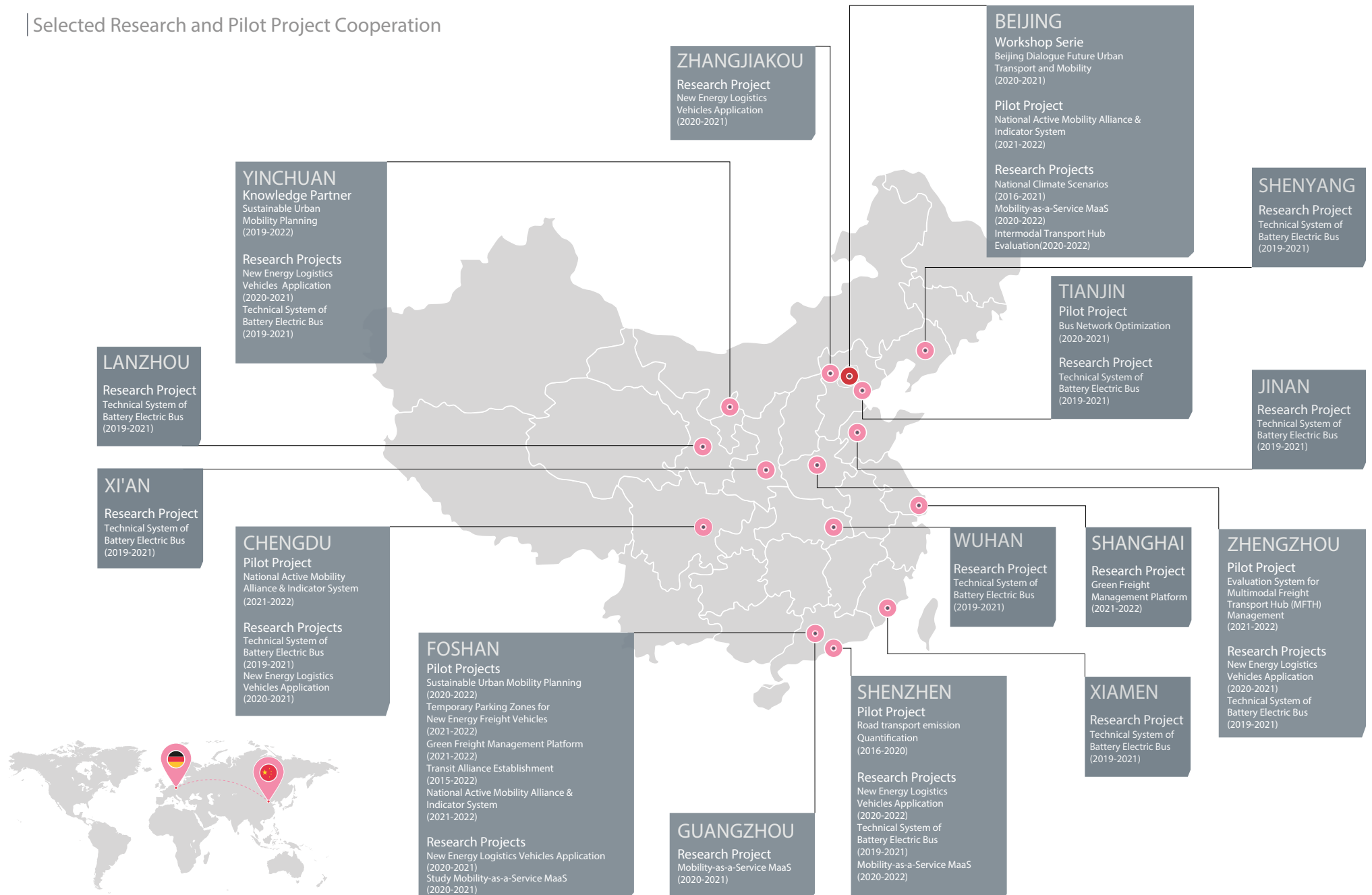
**Project** 2015-2022

**Duration**

**Project Description** The Sino-German Cooperation on Low Carbon Transport project (CLCT) is commissioned by the International Climate Initiative (IKI) of the German Federal Ministry for Economic Affairs and Climate Action (BMWK). The CLCT project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close collaboration with the Ministry of Transport (MoT) of the People's Republic of China.

# Sino-German Cooperation on Low Carbon Transport (2015-2022)

## | Selected Research and Pilot Project Cooperation





# Background

To achieve the dual carbon goals of peaking carbon dioxide emissions before 2030 and achieving carbon neutrality before 2060, China started implementing various measures to drastically reduce its emissions.

In the transport sector, these include the promotion of electro-mobility and smart transport systems, the expansion of public transport, the promotion of shared mobility, walking, and cycling, and the promotion of intermodal transport aiming at shifting freight transport volumes from the road to more climate-friendly means, including rail and inland waterways.

The CLCT project, implemented from 2015 to 2022, supported the China's Ministry of Transport (MoT) and other partners on national and city level in elaborating effective and efficient implementation strategies and policies to further develop a climate-friendly transport sector in China.

It supported the Sino-German policy dialogue on long-term climate change mitigation strategies in the transport sector. Through various project activities, CLCT also facilitated the exchange on the potentials of digitalisation, innovative technologies, and integrated mobility concepts for fostering and promoting sustainable and low carbon transport and mobility.

The project facilitated policy dialogues and exchanges, sector-specific knowledge sharing and research, implemented pilot projects at city level, and expanded specialist expertise. Chinese partners were engaged and supported in priority areas of passenger and freight transport, particularly on the following topics:

- Transport climate-policy and multi-stakeholder dialogues,
- Sustainable Urban Mobility Planning (SUMP),
- Mobility-as-a-Service (MaaS),
- Electro-mobility in the fields of urban buses and urban delivery vehicles,
- Climate-oriented bus network optimisation,

- Establishment of an Active Mobility Alliance in China,
- Intermodal transport standardisation and hub evaluation, and
- Sustainable urban freight and logistics.

The Sino-German Cooperation on Low Carbon Transport project (CLCT) is commissioned by the International Climate Initiative (IKI) of the German Federal Ministry for Economic Affairs and Climate Action (BMWK).

The CLCT project was implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close collaboration with the Ministry of Transport (MoT) of the People's Republic of China.

## Supported by



中华人民共和国交通运输部  
Ministry of Transport of the People's Republic of China

## Implemented by

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

## In Cooperation with



交通运输部科学研究院  
China Academy of Transportation Sciences



深圳市城市交通规划设计研究中心有限公司  
SHENZHEN URBAN TRANSPORT PLANNING CENTER CO., LTD.



交通运输部规划研究院  
Transport Planning and Research Institute, Ministry of Transport, China



北京交通发展研究院  
Beijing Transport Institute



交通运输部公路科学研究院  
RESEARCH INSTITUTE OF HIGHWAY MINISTRY OF TRANSPORT



佛山市交通运输局  
Foshan City Transportation Bureau



## Focal Topics

The CLCT project supported the China's Ministry of Transport (MoT) and other partners on national and city level in elaborating effective and efficient implementation strategies and policies to further develop a climate-friendly transport sector in China.



Political Dialogue



Monitoring, Reporting, and Verification



Active Mobility



Public Transport



Freight & Logistics

## Key Figures



10+ Research Studies



10+ Delegations



3 Cooperative Initiatives



60+ Articles



6 Pilot Projects



3 Methodological Instruments



50+ Workshops/  
Trainings



500+ Staff  
Trained

# Policy Briefings



## Outline for Building China's Strength in Transport

Transport plays a significant role in achieving China's ambitious goal to reduce its carbon emissions. In its 13th Five-Year Plan (2016-2020), China set and implemented various measures to develop its transport sector in a more integrated and sustainable manner.

This document introduces and provides an overview of the "Outline for Building China's Strength in Transport," a policy based on China's 13th Five-Year Plan for Economic and Social Development. Approved by the Central Committee of the Communist Party of China (CPC) and the State Council of the People's Republic of China on 19th September 2019, it describes the future vision and roadmap for China's transport sector to establish itself as a global transport powerhouse by 2050.

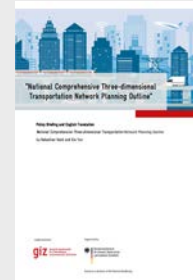
As a long-term oriented top-level and systematic guidance plan, the document lays out the country's long-term transportation strategies in two phases and further specific implementation plans at macro-level.



## National Comprehensive Three-Dimensional Transportation Network Planning Outline

This document provides a briefing and English translation of the "National Comprehensive Three-Dimensional Transportation Network Planning Outline," which was issued by the CPCCC and the State Council of the People's Republic of China on 24th February 2021.

The outline is a strategic top-level policy that aims to establish a national comprehensive three-dimensional transport network as the foundation of inter-provincial and regional integration, with international connectivity and respective infrastructure construction and development of related industries. It further describes the integration of China's transport and logistics system and industry with the world, and the development of new governance mechanisms for integrated transport.



## NEV Development Plan 2035

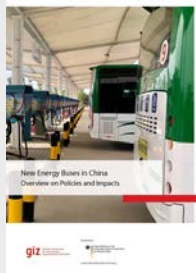
New Energy Vehicles (NEV), with an integration of new energy, Big Data, Artificial Intelligence (AI), and other transformative technologies, play a significant role in China's transition from a major automotive nation to a global automotive powerhouse.

This document provides a briefing and the English translation of the original "NEV Industry Development Plan" (2021-2035), which was published by the State Council of the People's Republic of China on 2nd November 2020. It is a strategic top-level policy that guides the development of a comprehensive and fully integrated NEV and Intelligent Connected Vehicle (ICV) ecosystem in China. The document lays out key fields and emerging trends for the Chinese NEV and ICV market.

It is a strategic top-level policy that guides the development of a comprehensive and fully integrated NEV and Intelligent Connected Vehicle (ICV) ecosystem in China and lays out key fields and emerging trends for the Chinese NEV and ICV market.







## New Energy Buses in China: Overview on Policies and Impacts

This report, produced by the China Automotive Technology and Research Center (CATARC), provides an overview on the development of NEVs in China, and the responsibilities and relevant governmental departments pertaining the promotion of urban buses. It then summarises the key policies issued and implemented by the central government and local authorities to promote New Energy Buses up to 2020.



It also delves into the impacts of policies introduced to boost the competitive advantage of New Energy Buses to conventional combustion engine buses. The report also gives readers insights into key areas that are important for achieving the transition from a subsidy-based to a more market-oriented development of NEVs in China.



## Work Plan for Promoting the Development of Multimodal Transport and Optimising and Adjusting the Transport Structure (2021-2025)

This document provides a briefing and English translation of the five-year “Work Plan for Promoting the Development of Multimodal Transport and Optimising and Adjusting the Transport Structure” (2021-2025), which was issued by the State Council of the People's Republic of China on 7th January 2022.



As per the goals set out in the Work Plan, a more integrated, effective, and environmentally friendly freight transport system is expected to be developed by 2025. A transport composition, in which railways and waterways dominate the medium- and long-distance transport of bulk cargo and containers, will be basically established.

The Plan calls for more efforts to promote a unified and open market environment, deepen reforms in railways and other crucial industries, and regulate fee collection at crucial transportation links. Additionally, it outlines solutions for the “chronic pain” of a last mile connection for transshipment.

# Reports

## Towards Zero Emissions: China's Climate Pathway and its Implications for the Transport Sector



In order to align the Chinese transport sector with the country's dual carbon goals, clear strategies and ambitious measures are needed. This includes not only the adoption of innovative technologies but also an accelerated shift to climate-friendly transport modes and a stronger focus on trip avoidance through holistic urban planning.

This paper was produced together with the IKI project NDC-TIA (NDC Transport Initiative for Asia). It provides an overview of China's climate protection pathway with regards to the role of the transport sector in achieving carbon dioxide emission peaking before 2030 and carbon neutrality before 2060. It further aims at fostering debates on the policies, technologies, measures, and partnerships needed to achieve those targets.

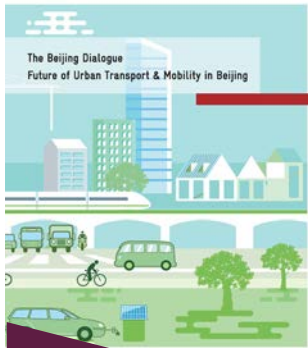
The paper also lists key selected approaches and measures that can contribute to achieving the set climate goals. Its recommendations for an effective decarbonisation strategy include such measures as aligning the transition in the transport and energy sectors, or specific suggestions for achieving decarbonisation in four priority areas (the Four Nows), namely freight, aviation, shipping, and cities.

Publication Year  
2021

Authors  
GIZ  
Sebastian Ibold  
Yun Xia



## The Beijing Dialogue: Future Urban Transport & Mobility in Beijing



**Publication Year**  
2022

**Authors**  
*BTI*

Yongshen Quan  
Jifu Guo  
Tao Gu  
Chunyan Li  
(as technical  
advisors)  
Xiaohong Liang  
Hao Kong  
Qi Gao  
Zhexi Zhao  
Xueqi Lei  
Qing Xu  
Bingmin Fang  
Yi Zhong



EN version CN version

Beijing, with over 21 million inhabitants, is striving to develop a future-oriented, sustainable urban mobility system to ease traffic congestion, alleviate air pollution, and help achieve China's dual carbon goals.

To foster international exchange and formulate a vision and roadmap for sustainable mobility in Beijing, the Beijing Transport Institute (BTI), GIZ, and Agora Verkehrswende (Agora) jointly initiated the "Beijing Dialogue". As part of the initiative, two workshops were held with experts from industry, the public sector, and academia to debate the vision, infrastructure, technologies, and implementation roadmap for future sustainable urban mobility.

The Beijing Dialogue also produced this report on Future Urban Transport & Mobility in Beijing, based on desktop research, online surveys, and results of the two workshops. It describes the status quo and trends in urban planning, demographic changes, and technology development in Beijing.

Providing a vision of a green, intelligent, and shared mobility system, and exploring a roadmap for such a system in Beijing, the report gives recommendations to local government and relevant stakeholders.

## CRTEM / HBEFA China Road Transport Emission Model

The "China Road Transport Emission Model" (CRTEM) – also known as "HBEFA China" based on its European counterpart, the "Handbook of Emission Factors for Road Transport" (HBEFA) – is a model for bottom-up emissions calculations for road transport.

By differentiating traffic situations within road networks and considering the dynamic composition of vehicle fleets over time, HBEFA allows estimating the emission impact of different types of transport policies.

Developed by project partners INFRAS and the Shenzhen Urban Transport Planning Center (SUTPC), CRTEM/HBEFA China provides a model adapted to the context of Chinese cities and was applied for transport planning purposes in Shenzhen. This report outlines the approach, development, and status quo of CRTEM/HBEFA China, and illustrates present and possible future use cases.

In a 2022 MRV training focused on CRTEM/HBEFA China and lessons from its application in Shenzhen, transport planners from more than 20 additional cities were introduced to the model.



**Publication Year**  
2021

**Authors**  
*INFRAS*

Dr Benedikt Notter  
*GIZ*

Sebastian Ibold  
Dr Xuan Ling  
Dr Marie Peters  
Yingjie Wu  
*SUTPC*

Yuting Huang



## Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan (2nd Edition - CN Translation)



A Sustainable Urban Mobility Plan (SUMP) is a short, medium to long-term collaboratively developed strategic and comprehensive transportation plan, designed to promote the sustainable and low carbon development of cities and their surrounding areas, to improve people's quality of life, and to enhance the city's competitiveness and vitality.

The Second Edition of the Guidelines for Developing and Implementing a SUMP was co-authored by multiple urban mobility experts and institutions, edited by Rupprecht Consult, and serves as an updated version of the 2013 SUMP Guidelines.

This translation of the Guidelines into Chinese, funded by the IKI of the German government and organised by GIZ, provides urban planners and transport authorities in China with direct access to the tools for developing SUMPs, and guided the development of the SUMP Foshan Pilot Project.

**Publication Year**  
2019

**Authors**  
*Rupprecht Consult*  
Siegfried Rupprecht  
Lasse Brand  
Susanne Böhler-Baedeker  
Lisa Marie Brunner



EN version CN version

## Sustainable Urban Mobility Plan Foshan Pilot Project

In its first application in China, the SUMP concept supports the city of Foshan in its ambition to further promote low carbon, green, and human-centred mobility.

The SUMP Foshan Pilot Project was conducted in collaboration with the Foshan Transport Bureau (Foshan TB), the Foshan Public Transport Management Co. (Foshan TC), the China Sustainable Transportation Center (CSTC), and was supported by Rupprecht Consult. This report follows the development of the SUMP Foshan Pilot Project according to the SUMP process.

For the purpose of the pilot project, the SUMP process was conducted up to Step 9, i.e. from analysis, scenario-building, and visioning, to producing strategic measures at city-level, as well as creating specific measures for implementation at showcase area-level.

Potential follow-up actions at the city level – to be taken after the implementation of the showcase area measures – were also identified. Through capacity development activities conducted in parallel, further Chinese cities have expressed interest and received training in applying SUMP in their own mobility planning.

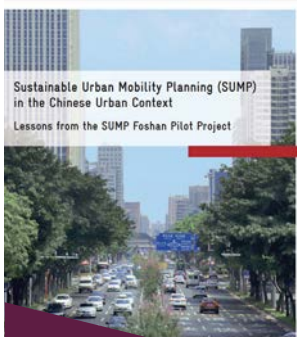


**Publication Year**  
2022

**Authors**  
*CSTC*  
Dr Jiangyan Wang  
Yang Jiang  
Hao Wang  
Suping Chen  
Yang Liu  
Xiaoyan Kang  
Jieying Yin  
Wenshuo Zhang  
Yunxia Xie  
*Foshan TC*  
Xiaohui Li  
Qiaoqiao Zhang



## Sustainable Urban Mobility Planning (SUMP) in the Chinese Urban Context: Lessons from the SUMP Foshan Pilot Project



**Publication Year**  
2022

**Authors**  
CSTC

Dr Jiangyan Wang  
Yang Jiang  
Hao Wang  
Suping Chen  
Yang Liu  
Xiaoyan Kang  
Jieying Yin  
Wenshuo Zhang  
Yunxia Xie  
Foshan TC  
Xiaohui Li  
Qiaoqiao Zhang



EN version CN version

SUMP is intended to be promoted in China as a key planning tool to support the country's ambition to foster integrated mobility planning and shift to low carbon transport.

The city of Foshan in Guangdong province became the pilot city to explore the feasibility, localisation, and potential impacts of SUMP in Chinese cities. Through wider stakeholder engagement and public participation as part of the planning process, the SUMP Foshan Pilot Project aims at providing a more practical and comprehensive vision to Foshan.

This report, produced by the CSTC and reflecting the development of the SUMP Foshan Pilot Project, serves as a guideline for SUMP development adjusted to the Chinese urban planning context.

Drawing on Foshan's experience with SUMP, the report provides a localised approach for policy makers and planners in Chinese cities seeking to foster climate friendly urban transport while reflecting the needs of transport stakeholders and residents, and to further integrate the SUMP concept into their transport and mobility planning systems.

## The Uptake of New Mobility Services: Learnings from Asia

New Mobility Services (NMS) that are enabled by disruptive technologies and innovative business models that facilitate effective sharing of mobility resources – such as ride-hailing or dock-less bike sharing – have been emerging with the promise of contributing to more sustainable and climate-friendly mobility in Asia and beyond.



Authored by public policy and technology expert Dr Tom Vöge, this study provides an overview on the evolution of NMS in Asia. It outlines the backdrop to NMS development, as characterised by global and local trends, and the opportunities for transformation as enabled by technological advancements.

The study further examines the concept of NMS and its governance aspects based on global experiences and best practices, and provides strategic insights and recommendations for utilising NMS to support sustainable urban mobility in Asia.

Based on the analytical findings of the study, ten guiding principles were formulated to help regulators, city officials, and transport planners but also the operators of NMS to provide the optimal level and type of regulatory oversight over the implementation and operation of NMS in Asia.



**Publication Year**  
2021

**Author**  
Dr Tom Vöge





## From MoD to MaaS: Promoting China's Transition Towards Sustainable Transport Integration



To mitigate urban traffic congestion, noise, and air pollution, and make transport more seamless, inclusive, and climate-friendly, a higher degree of integration between different mobility services is necessary.

One potential solution is Mobility-as-a-Service (MaaS), a mobile distribution model that integrates different forms of transportation services into an online platform.

This study, carried out by the China Academy of Transportation Sciences (CATS) of the MoT, lays out the institutional foundations towards the creation of a MaaS ecosystem in China, integrating app-based Mobility-on-Demand (MoD) services and traditional transport modes.

It analyses global practices of MaaS, examines the current landscape, stakeholders, and barriers to China's MoD services, and reveals local trails of MaaS cases through various field studies. The study also provides policy recommendations for the further integration of MoD and the development of a MaaS ecosystem in China.

**Publication Year**  
2022

**Authors**  
CATS  
Dr Zhifang Yin  
Wandi Zhang  
Chao Li



## Towards a National Active Mobility Strategy and an Indicator System for Active-Mobility Friendly Cities in China

Active mobility refers to human-powered modes of transportation such as cycling and walking that constitute a healthy part of urban life and help to accelerate the decarbonisation of the transport sector.

This report, produced in collaboration with CATS and SinoCarbon, examines the local conditions in Chinese cities and draws on international experiences to put forward a strategy for the advancement of Active Mobility Friendly Cities in China.

The report introduces an Indicator System to assess the active mobility friendliness of Chinese cities. As part of the report, the evaluation system was piloted in the cities of Beijing, Chengdu, and Xiamen. The results and best practices of national and international frontrunners provide input for policy recommendations at the city and national level.

These recommendations serve the establishment of a National Active Mobility Strategy, which aims to systematically guide Chinese cities to become more active mobility friendly, thus contributing to climate targets and improving urban quality of life.



**Publication Year**  
2022

**Authors**  
CATS  
Dr Lei Li  
SinoCarbon  
Guoqiang Qian



## Barrier-Free Transport: Overview of Developments in the European Union and Germany



Barrier-free transport is a key element of sustainable, climate-friendly and inclusive cities. Many disabled persons without their own car rely on public transport. Accessible public transport is therefore essential for their participation in public life.

This brief report produced jointly by CLCT and its neighbouring project Sino-German Cooperation on Mobility and Fuels Strategy as a Contribution to the Mobility and Transport Transition (MKS), which is commissioned by the German Federal Ministry for Digital and Transport, gives an overview of the main policies, standards, and best practices regarding barrier-free transport in Germany and the EU.

The work on barrier-free transport in China and Germany not only aims to raise awareness for diversified mobility needs and common challenges in the provision of barrier-free transport, but also to connect stakeholders from both countries.

For that purpose, MKS, CLCT, and the CATS brought together key stakeholders in barrier-free mobility from China and Germany to exchange on their different approaches and experiences in a jointly organised online conference in 2021.

**Publication Year**  
2021

**Authors**  
GIZ  
Mia Hallmanns  
Eric Thomas



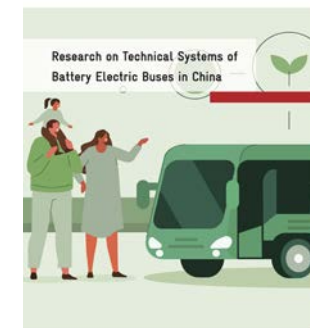
## Research on Technical Systems of Battery Electric Buses in China

The integrated and effective application of electric buses in public transport systems is an important key to lowering carbon and other air pollutant emissions and making transport more climate friendly. In recent years, the number of NEBs has rapidly increased in China, and China's promotion of NEBs has entered a new stage.

Focusing on high quality development, while also maintaining a steady increase in the number of NEBs, China faces several challenges in their effective promotion, such as a low operating efficiency, unreasonable layout of matching facilities, or insufficient maintenance of vehicles.

This study was conducted by the CATS and follows the life cycle of battery electric buses, from procurement, charging, operation, maintenance, to the decommissioning of batteries.

The purpose of this research project is to enhance the application of NEBs in China and to share China's experiences with other countries. It provides a technical guide for stakeholders in each of the procedures to achieve safety, efficiency, and sustainability.



**Publication Year**  
2022

**Authors**  
CATS  
Cheng Li  
Zhongyi Wu  
Xiaofei Li  
Kai Mu



## Overview on Battery Swapping and Battery-as-a-Service (BaaS) in China



The development of NEV, particularly battery electric vehicles, is widely seen as key to making transport more sustainable and climate-friendly, and in line with the promotion of renewable energy. Despite significant advancements in battery and charging technology in recent years, limitations in battery electric propulsion, particularly regarding its recharging time, travel range, or battery depreciation, hinder the transition from internal combustion engines to battery vehicles.

Battery swapping promises to solve those issues by, as a complement to conventional charging, allowing the change of battery packs from one that is empty to one that is charged, within minutes.

This report provides a brief overview of the current development status of battery swapping and Battery-as-a-Service (BaaS) in China. It outlines the policies, standards, and stakeholders relevant to battery swapping and BaaS, aiming to present insights on both the drivers and barriers faced by the related industry.

The report concludes with the key aspects to consider when assessing the opportunities and challenges of battery swapping and BaaS in China.

**Publication Year**  
2022

**Authors**  
GIZ  
Sebastian Ibold  
Yun Xia



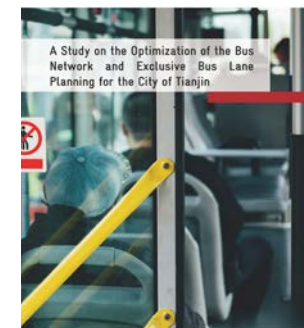
## A Study on the Optimisation of the Bus Network and Exclusive Bus Lane Planning for the City of Tianjin

Located in China's Beijing-Tianjin-Hebei (JingJinJi) city cluster region, the city of Tianjin plays a key role in the implementation of the "Blue Sky Protection Campaign," an air pollution control programme under China's Ministry of Ecology and Environment (MEE). As part of its efforts, Tianjin achieved the full electrification of its urban bus fleet by end of 2020.

Produced in collaboration with the CSTC and the Tianjin Municipal Engineering Design & Research Institute (TMEDI), this report seeks to assist the transport authorities of Tianjin in comprehensively improving the service level, efficiency, and climate friendliness of Tianjin's bus system through bus network and bus lane planning.

It also assesses problems relating to Tianjin's bus network and operation, and proposes macro development strategies as well as detailed optimisation suggestions to tackle these for the 2021-2025 period.

The results of this project have been incorporated into the "Tianjin 14th Five-Year Special Plan for Comprehensive Transportation" and will be gradually implemented within the 14th Five-Year Plan period.

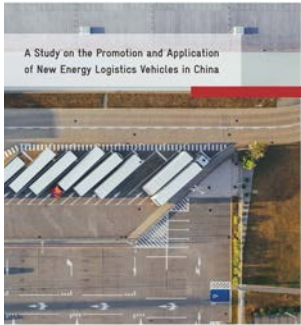


**Publication Year**  
2022

**Authors**  
CSTC  
Yunxia Xie  
Suping Chen  
Jiangyan Wang  
Jieying Yin  
Siyuan Jiang  
TMEDI  
Yin Jiang  
Rui An



## A Study on the Promotion and Application of New Energy Logistics Vehicles in China



In 2017, the MoT, MPS, and MofCom jointly launched the “Green Urban Freight Pilot Programme,” aiming to foster, promote, and support the effective implementation of NEVs in the urban delivery sector and giving priority to road vehicles in urban areas.

The study, produced in collaboration with the Transport Planning and Research Institute (TPRI), identifies the key challenges of New Energy Logistics Vehicle (NELV) adoption in China and provides a detailed analysis of the future trends and application scenarios.

As part of the study, local investigations of the development status of NELVs were carried out in the case cities of Yinchuan, Zhengzhou, Chengdu, Shenzhen, and Foshan, as well as through online interviews and surveys with representatives from the city of Zhangjiakou.

Reflecting the findings and approaches from the case cities, the study outlines a set of comprehensive policy recommendations on national and local level to support the promotion of NELVs for a green and low carbon delivery sector in China.

**Publication Year**  
2022

**Authors**  
TPRI

Meizhen Gao  
Xiaoyu Tan  
Xiaoyi Li  
Honglei Xu  
Quansheng Huang  
Renjie Wang

GIZ  
Dr Xuan Ling



## Research on the Setting of Temporary Loading/Unloading Zones for New Energy Logistics Vehicles in Chancheng District of Foshan, Guangdong Province, P.R. China



With a growing demand for urban freight, Foshan has taken various steps to promote NELVs to pursue low carbon freight development. However, until recently, temporary parking zones for NELVs had not caught the attention of policy makers.

This study, developed in collaboration with the Nanjing Institute of City and Transport Planning (NICTP), provides a scientific and comprehensive methodology for setting temporary parking zones for NELVs. It aims to improve efficiency and lower carbon emissions related to urban delivery and the loading/unloading of urban logistics vehicles.

It is the first scientific planning methodology created for the establishment of loading/unloading zones for NELVs. Based on domestic and international case study analyses, and combined with the characteristics of Foshan's Chancheng District, two pilot zones have been built in Chancheng District to implement the plan and test the scientific concept.

The study's findings provide a blueprint to optimise loading and unloading of NELVs in urban areas across China, including by use of the methodological framework of Sustainable Urban Logistics Planning (SULP).

**Publication Year**  
2022

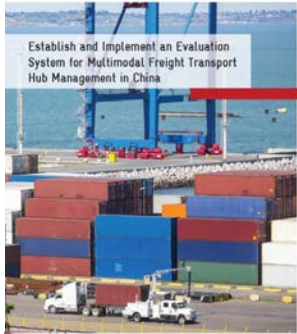
**Authors**  
NICTP

Xiaozhou He  
Tao Yang  
Peng Liu  
Chaoping Liu  
Haoxuan Fan  
Qianwen Ye





## Establish and Implement an Evaluation System for Multimodal Freight Transport Hub Management in China



Multimodal Freight Transport Hubs (MFTH) are an essential knot in the infrastructure connectivity of China's modern intermodal transport development. In 2016, eighteen government agencies including the MoT and NDRC have issued the "Notice on Further Encouraging the Development of Intermodal Transport," which specifically emphasised the development of MFTH.

Although there are several MFTHs in China, their development is unbalanced. Neither the MoT nor MFTH operators have a unified evaluation tool to analyse their management performance as well as their environmental impacts.

This project, conducted in cooperation with the TPRI of the MoT, provides such an MFTH evaluation system. Adjusted to local conditions and China's strategic development requirements, it puts particular emphasis on environmental and climate indicators. The project report also documents its four pilot applications and gives further policy recommendations for relevant stakeholders.

Key project outputs have also been reflected in the "14th Five Year Plan for the Development of Comprehensive Transport Services" under the task of "improving the comprehensive transport hub service level."

**Publication Year**  
2022

**Authors**  
TPRI

Wei Wang  
Yunhan Li  
Xiaotong Liu  
Yongcun Wei  
Yongfeng Liu  
Jiayuan He  
Guanliang Luo  
Jiahua Gan  
Qian Dai

DGG  
Steffen Nestler  
Thomas Nobel



## Developing Smart Logistics for Sustainable Transport

Smart concepts are becoming increasingly relevant for efforts to increase efficiency, apply big data technologies across industries, and, particularly in the logistics sector, developing digital tools for optimal monitoring and decarbonisation purposes.

This joint study, conducted by the Research Institute of Highway (RIOH) of MoT and Fraunhofer IML, focuses on the role of smart logistics in sustainable and low carbon development, examining differences as well as similarities in the understanding and application of smart logistics in China and Germany.

Based upon this research, a common understanding of smart logistics is proposed, and an analysis of key driving factors and future development trends of smart logistics applications in China and Germany is provided.

Finally, recommendations for an effective further development and implementation of smart logistics are put forward.



**Publication Year**  
2022

**Authors**  
RIOH

Wenwen Jiao  
Dachuan Ding  
Hongyu Che

IML

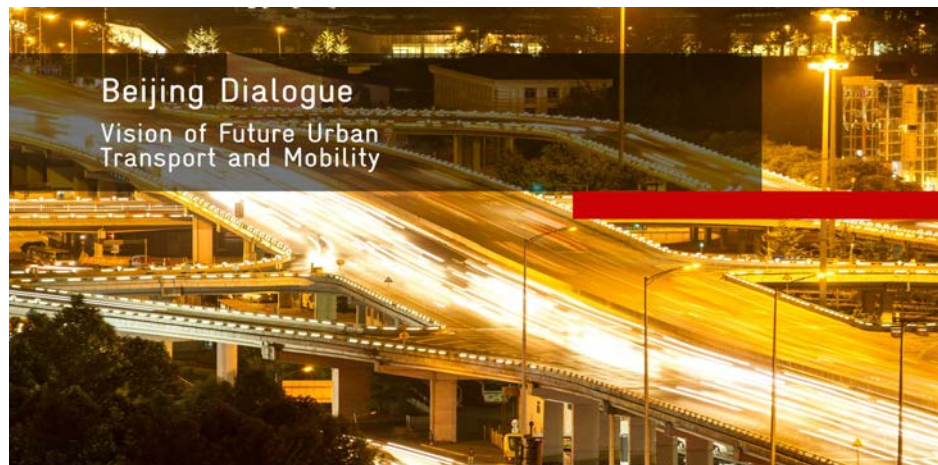
Dr Matthias Parlings  
Philipp Gauß  
Sanja Gast  
Nils Saorski  
Shutong Jiang



# Videos



GIZ is implementing projects on behalf of German Federal Ministries, aligning the transport sector with international practices and standards.



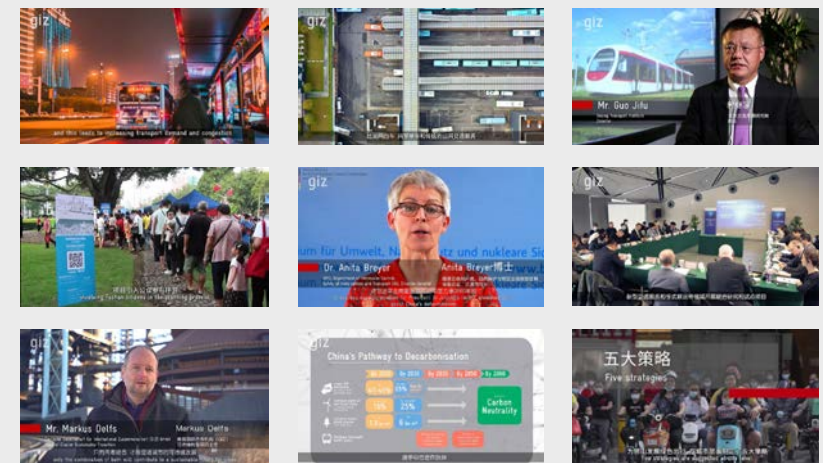
The Beijing Dialogue series aims to establish a common vision of the future of urban transport, and to discuss the political measures needed to achieve it.



This video gives insights into Foshan's efforts in exploring a green mobility development pathway, and presents the key outcomes of the SUMP Foshan Pilot Project.



## Glimpses into the videos





# In the Spotlight



**Top:** CLCT project kick-off and signing ceremony in April, 2015, Beijing; *Source: GIZ*

**Left:** Exchange between the Parliamentary State Secretary of the BMUB, Ms Rita Schwarzelühr-Sutter, and the Vice Minister of the MoT, Mr Dai Dongchang; *Source: GIZ*

**High-Level Dialogue**  
between the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU)  
and the Ministry of Transport (MoT) of the People's Republic of China  
as part of the Sino-German Cooperation on Low Carbon Transport

21.01.2021



**Top:** High-level dialogue between BMU and MoT in January, 2021; *Source: GIZ*

**Bottom:** SUMP Conference together with the China Communications and Transportation Association (CCTA), Jiangsu Transportation Research Institute (JSTI) and the Sino Road Institute of Transportation Science Consulting Co., Ltd (SRITS) in November, 2019, Beijing; *Source: GIZ*







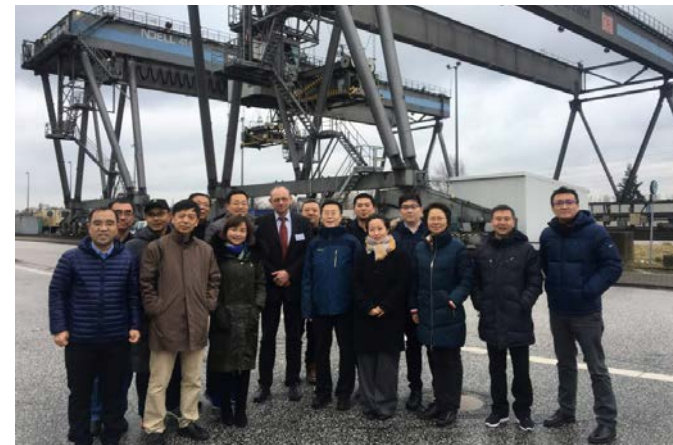
Top: Carbon Footprinting Workshop August 25, 2015, Beijing; *Source: GIZ*

Middle and Right: Second workshop of the Beijing Dialogue workshop series in June, 2021, Beijing; *Source: GIZ*



Left and upper right: Delegation from the MoT, TPRI, CATS, and RIOH visiting Berlin and Hamburg in October, 2016; *Source: GIZ*

Lower right: Delegation from the MoT focused on dangerous goods visiting Cologne and Bonn in November, 2016; *Source: GIZ*



Left: Delegation from the MoT visiting Berlin and Hamburg in December, 2017; *Source: GIZ*





**Left:** Kick-off workshop to the study "Developing Smart Logistics for Sustainable Transport" in March, 2021; *Source: GIZ*

**Middle:** 2020 EB-PAC (Electric Bus Performance Assessment Competition) & Interim Workshop for the e-bus study with CATS from September 16 to 18, 2020, Chongqing; *Source: GIZ*



**Right:** Launch of the Active Mobility Alliance with CATS in August, 2022, Beijing; *Source: GIZ*



**Left:** Research trip for the study on urban freight vehicle electrification with TPRI in November, 2020 in Yinchuan, Chengdu, Foshan, Shenzhen, and Zhengzhou; *Source: GIZ*

**Right and Bottom:** On-ground activities of SUMP pilot project in September, 2021, Foshan; *Source: GIZ*







Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices  
Bonn and Eschborn, Germany

GIZ in China  
Tayuan Diplomatic Office Building 2-5  
14 Liangmahe South Street, Chaoyang District 100600 Beijing, P. R. China

T +86 (0)10 8527 5589  
F +86 (0)10 8527 5591  
E [info@giz.de](mailto:info@giz.de)  
I <http://www.giz.de/china>