

# Transformative living labs in urban electric mobility

## **SOLUTIONS**plus

Integrated Urban Electric Mobility Solutions in the Context of the Paris Agreement, the Sustainable Development Goals and the New Urban Agenda

**Oliver Lah**

Urban Electric Mobility Initiative



Funded by  
the European Union

# SOLUTIONSplus

In Co-flagship project on Urban mobility and sustainable electrification in large urban areas in developing and emerging economies



Funded under the Horizon 2020 call GV-05-2019

Duration: 1 January 2020 - 31 December 2023

Total budget: €20,233,098.75 (EU

Contribution: €17,970,258.75)

Consortium of 47 partners, 116 associated and support partners

10 Living Labs:

**Asia:** Kathmandu (Nepal), Manila/Pasig (Philippines), Hanoi (Vietnam), Nanjing (China)

**Africa:** Kigali (Rwanda), Dar es Salam (Tanzania),

**LATAM:** Montevideo (Uruguay), Quito (Ecuador),

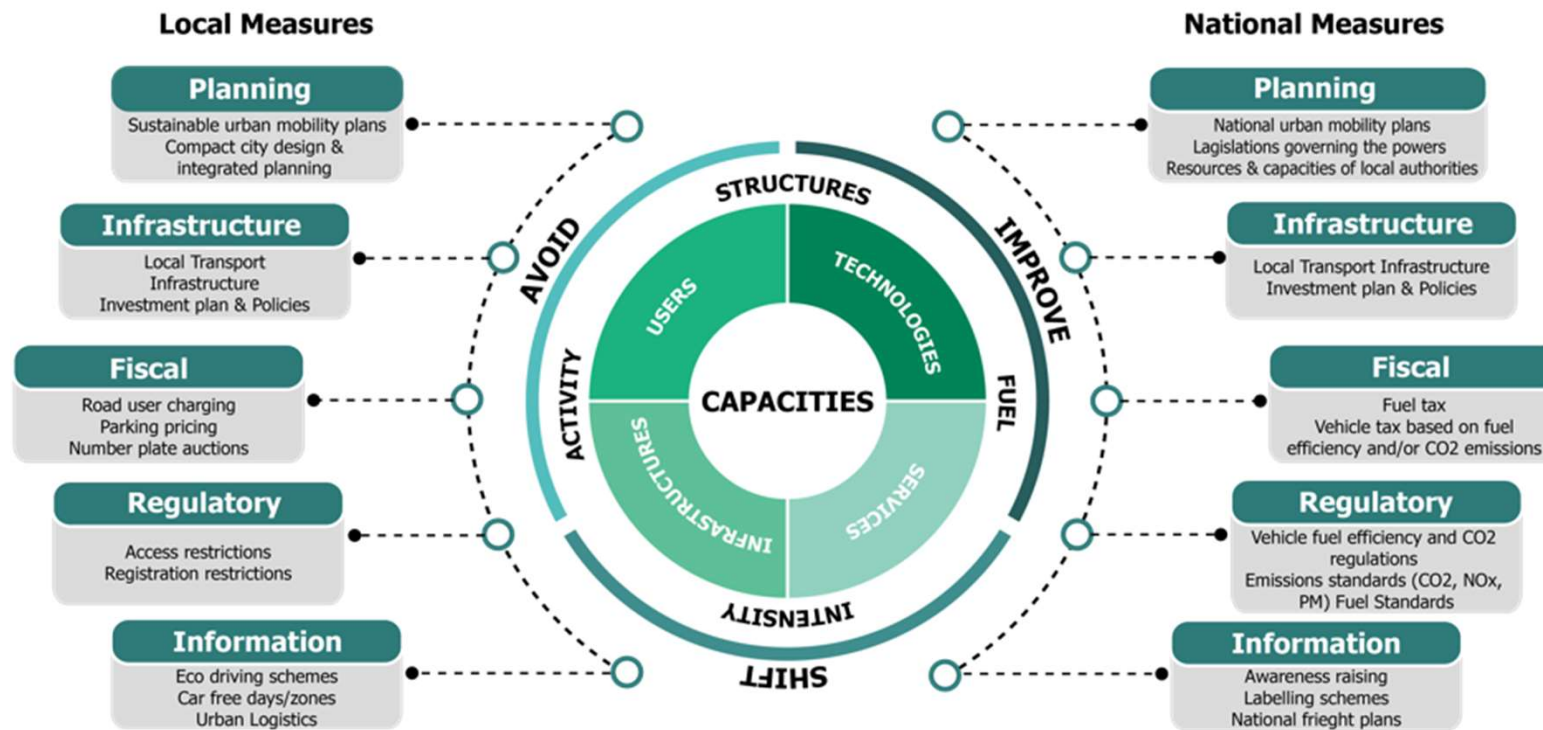
**Europe:** Hamburg (Germany), Madrid (Spain)



The project has received funding from European Union's Horizon 2020 research & innovation programme under grant agreement no. 875041

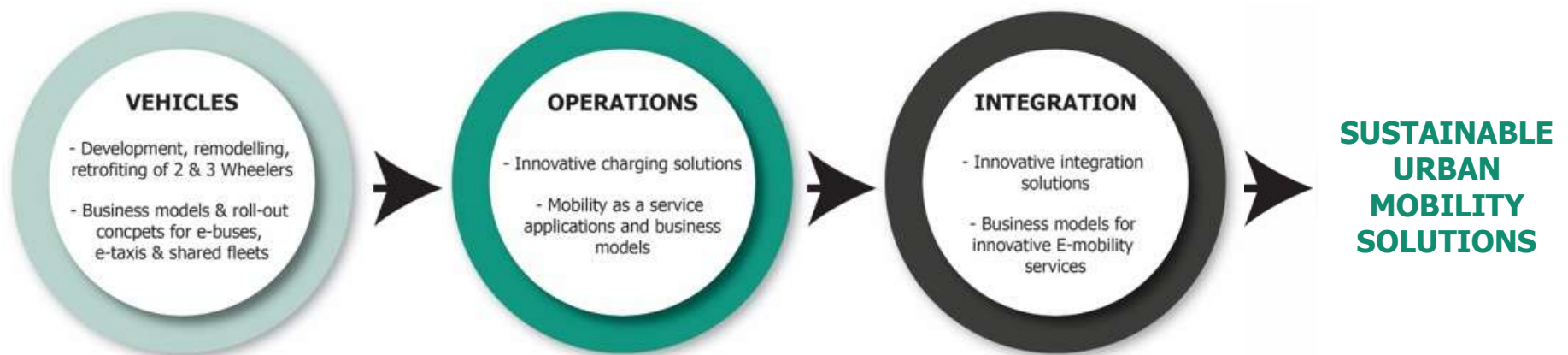


## Safe System Approach to Decarbonising Mobility



## SOLUTIONSplus Objectives & Concept

**Accelerate transformational change towards sustainable urban mobility through innovative and integrated electric mobility solutions**



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## SOLUTIONSplus Objectives & Concept



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## Joint Global E-mobility Platform



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## MILESTONE ACHIEVED

- Draft Toolbox launched
- Impact assessment reports presented to partner cities and stakeholders
- Training and capacity building program: ULL Workshop, Global E-Learning Program, Regional Trainings
- Site visits
- Global (online) Community of Practice launched
- Start-up incubator launched
- Technical specifications validated by the partner cities
- Nine demonstration projects launched
- Website launched
- Mid-term and final report
- Exploitation action started

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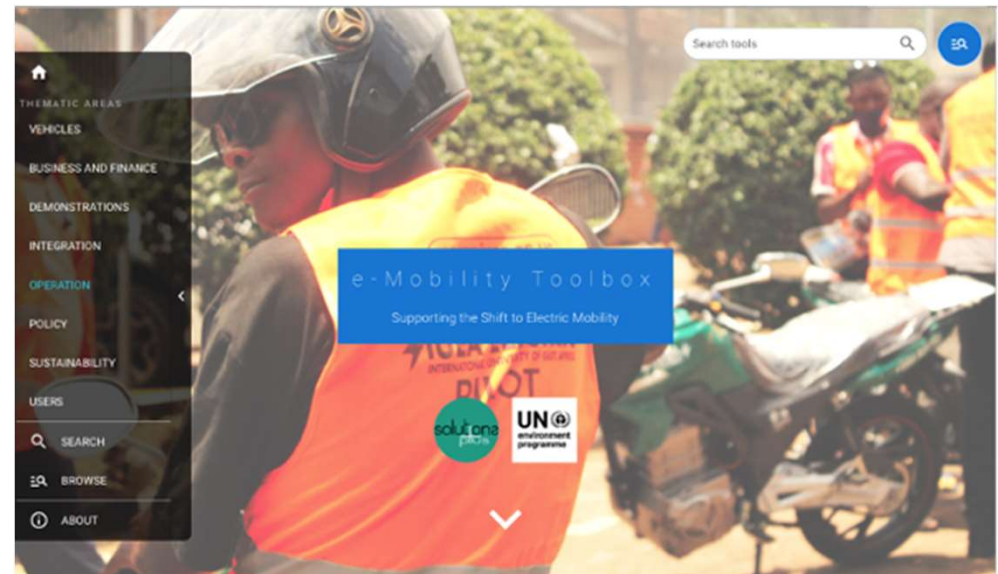
## E-Mobility Toolbox



- Global mobility toolbox has been launched
- Total number of tools: 295
- Total thematic pages: 84
- Link: <https://emobility.tools>

### Dashboard

 Tool pages	 Thematic pages	 Keywords
Total: 295 Published: 292 Unpublished: 3 Tool links: 236 Videos: 63 Assets: 94	Total: 84 Published: 82 Unpublished: 2	Total: 437 Without synonyms: 193 Synonyms: 244





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## CAPACITY BUILDING ACTIVITIES

1. Solutionsplus Global E-Learning Programme
2. Peer – Peer Exchanges
3. Regional Training (Asia, Africa, Europe, LATAM)
4. E-course 2 of the SOLUTIONSplus Global e-learning programme
5. E-course: Transformative Living Labs in Mobility at MITx
6. Urban Living Lab Workshop



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## Demonstration Activities

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## Activities in Asian cities (Hanoi, Pasig and Kathmandu)



### BOOSTING CAPABILITIES OF STAKEHOLDERS

- Two Asia Regional (and city specific) trainings on low carbon mobility/ e-mobility 2021 (online)
- Three Asia city specific trainings on e-mobility in Kathmandu, Hanoi and Pasig in 2022 (on-site)
- Peer to peer exchanges and Trainings on e-bike sharing in 2022 (online), E-buses in Kuala Lumpur, e-2/3 W in Bangkok, e-mobility in Manila (BAQ) and Seoul in 2023 (on-site)
- Site visit to Hamburg Hochbahn (2022), EMT Madrid and Kuala Lumpur E-BRT (2023) for showcasing e-buses and other e-mobility options



### FOSTER THE TAKE-UP OF E-MOBILITY INNOVATION

- Four local start-ups selected (two in Kathmandu, One each in Pasig and Hanoi) and engaged in prototypes development
- Three additional start-up selected (two in Thailand and one in Armenia)
- EU-Asia, Asia-Asia and Asia-other region collaboration
- Demo Launch in Kathmandu, Hanoi and Pasig in Oct-Nov 2022



### STRENGTHEN POLICY & BUSINESS COLLABORATION

- Constant consultation with national and local authorities on policy development
- Collaboration with EU companies, such as Testing 2<sup>nd</sup> life batteries from Batteries in Hanoi and Pasig, and technical advisory on prototypes in Pasig and Kathmandu, Valeo motors installed in Pasig prototypes



Hanoi Living Lab



Pasig Living Lab

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## Activities in Asian cities (Hanoi, Pasig and Kathmandu)

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### CREATE REFERENCE MODELS FOR E-MOBILITY INNOVATION

- Successful operation of remodelled e-3Ws for passenger and cargo in Kathmandu and shared e-mopeds in Hanoi (six months pilot)
- Data collection and stakeholders engagement in the demo impact assessment and analyse scale-up potential



### CONTRIBUTE TO INTEGRATION OF INNOVATIVE CONCEPTS INTO POLICY, FUNDING, RESEARCH

- Policy papers and city roadmaps under development and pre-feasibility study for MaaS in Kathmandu developed
- Inclusion of local universities in the project, including knowledge transfer
- Continued consultations and roundtables with key stakeholders for embedding outcomes and needs into policies and finance/business decision-making process.



Kathmandu Living Lab



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## Activities in LATAM cities (Montevideo & Quito)



### BOOSTING CAPABILITIES OF STAKEHOLDERS

- Regional trainings addressing local needs in 4 modules: 1) LEV regulations, 2) urban logistics, 3) charging infrastructure, and 4) e-buses
- P2P exchanges (virtual & on-site) on different topics with a focus on regional exchange
- Study visit to Madrid from local counterparts from Quito and Montevideo (Sept 2023)
- Hybrid training to the Montevideo Municipality about e-SUMP development (Oct / Nov 2023)
- Site visit from urban logistics expert to present the results, test and transfer the knowledge to local university of the logistics model developed by the ZLC (Nov 2023)
- Participation of 3 start-ups representatives of Quito, Montevideo and Bogotá in the International Cargo Bike Festival (ICBF) (Nov 2023)
- Collaboration with local universities to strengthen local capacities



### FOSTER THE TAKE-UP OF E-MOBILITY INNOVATION

- 6 local start-ups selected in pilot cities
- 5 additional start-ups selected in replication cities from the 12 applications received



### STRENGTHEN POLICY & BUSINESS COLLABORATION

- 6 city roadmaps for Latin America under development (Montevideo (done), Quito, Buenos Aires, Bogotá, San José and Cuenca)
- Collaboration with 5 EU companies in LEV design, batteries, retrofitting, charging equipment and ecosystem



Montevideo Living Lab

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## Activities in LATAM cities (Montevideo & Quito)

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### CREATE REFERENCE MODELS FOR E-MOBILITY INNOVATION

- Successfully implemented last-mile logistics pilots with 5 different operating schemes in Quito and Montevideo, showing an immense scale-up & replication potential in the pilot countries and the region
- Ongoing implementation of 5 replication projects in Bogotá, Buenos Aires (Metropolitan Area) and Cuenca, 4 focusing on urban logistics and 1 in inclusive e-bike sharing systems
- Sound data collection framework to assess and showcase the viability of scale-up and replication



### CONTRIBUTE TO INTEGRATION OF INNOVATIVE CONCEPTS INTO POLICY, FUNDING, RESEARCH

- Policy Papers on Regulations for LEV & Urban Logistics
- Building synergies with other projects, as well as cooperation and funding agencies, thus ensuring the continuation and consolidation of the pilots beyond SOL+
- Inclusion of local universities in the project, including knowledge transfer



Quito Living Lab

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## Activities in African cities (Kigali & Dar Es Salaam)



### BOOSTING CAPABILITIES OF STAKEHOLDERS

- 4 large Africa-specific regional and city training on EV Charging Infrastructure, EV Batteries, Public Transport Electrification E-Bikes
- 3 Peer-to-peer exchanges on e-bike sharing, electric three-wheelers, gender inclusion in e-mobility



### FOSTER THE TAKE-UP OF E-MOBILITY INNOVATION

- 8 local start-ups selected, collaboration with EU Industries
- City-specific budget to further support e-bike racks, municipal e-bike fleet, e-bike urban deliveries, charging infrastructure for feeder services



### STRENGTHEN POLICY & BUSINESS COLLABORATION

- Major role of SOLUTIONSplus in institutional coordination and policy development
- Policy support on identification of local barriers to electric mobility, EV and sustainable urban mobility policies, end-of-life management of EV batteries
- Support to the establishment of the Dar es Salaam Institute of Technology as a major EV Center

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Dar Es Salaam Living Lab



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## Activities in African cities (Kigali & Dar Es Salaam)



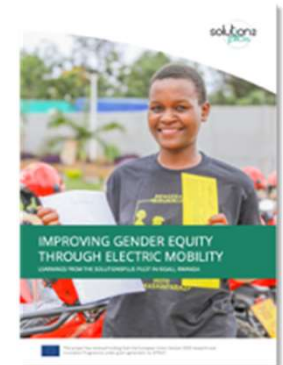
### CREATE REFERENCE MODELS FOR E-MOBILITY INNOVATION

- Urban design of localised e-mobility solutions in Kigali and Dar es Salaam
- Identification of two locally-specific focus areas: gender-inclusion through e-mobility, and electric bicycles
- Work on both new prototypes and retrofitted model



### CONTRIBUTE TO INTEGRATION OF INNOVATIVE CONCEPTS INTO POLICY, FUNDING, RESEARCH

- 3 Policy papers on EV Charging Infrastructure, Fiscal and Regulatory Conditions for E-Bikes, and Gender-inclusive E-Mobility
- Introduction of e-modes with lower exposure, e.g. e-bikeshare
- 1 high-exposure E-Mobility Forum in Dar es Salaam opened by the EU Delegation; advanced dialogue with EU Delegation for a follow-up project



Kigali Living Lab

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## Activities in European cities (Hamburg & Madrid)



### HAMBURG ACTIVITIES

#### E-Scooters



- Four (4) physical e-scooter parking zones have been established
- Over the course of the project, the number of active e-scooters has settled at over 300



#### Charging Solutions for E-taxis

- T-Systems initiated and coordinated the electrification of the taxi fleet together with the city of Hamburg.
- ComfortCharge installed the charging infrastructure at the premises of Deutsche Telekom & in Hamburg Airport for e-taxis
- T-Systems and Polis organized the City Dialogue to promote and replicate the living lab of Hamburg to other German cities.
- T-Systems initiated and managed together with the city of Hamburg the "Zukunftstaxi" project that will continue till 2023



#### Low Carbon Mobility Monitoring

- The living lab Hamburg has integrated a Low Carbon Mobility Monitoring (LCMM) tool to measure the fuel or electricity consumption and emissions of taxis



#### Design Studio

- TU Berlin students have collaborated in designing mobility hub for the city of Hamburg



Hamburg Living Lab

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## Activities in European cities (Hamburg & Madrid)



### MADRID ACTIVITIES

- Completion of the infrastructure works for the installation of the ABB charging solution Carabanchel bus depot.
- Development of software solutions towards support of multiple pantographs by an advanced multi-outlet bus charging solution;
- Testing a mobile inverted pantograph provided by ABB;
- Managing the new mobility hub with charging solutions for diverse services (carsharing, BiciPark) at Fuente de la Mora P&R facility;
- Participation at the forecasted exchange sessions and training activities as well as in events to disseminate the project (i.e. TRA Lisbon);
- Providing feedback for the peer-to-peer activities.

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Madrid Living Lab

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## HIGHLIGHTING ACHIEVEMENTS

### Expected Impacts: Contribute to the capability of urban mobility change makers

- 100 professionals in partner cities successfully participated in a structured programme based on the toolbox
- 800 registered participants at global and regional trainings
- 2,000 registered participants at SOLUTIONSplus e-learning courses
- Toolbox disseminated to at least 10,000 professionals
- Partnerships with at least 30 cities facilitated

### Expected Impacts: Contribute to SDGs: SDG 11 "Sustainable cities and communities" and SDG 13 "Climate Action"

- KPIs developed for the impact assessment and key objectives co-developed with local partners
  - Preparation of impact assessment report for demos that facilitate the assessment of scaled up e-mobility concepts
  - A detailed user needs assessment (conducted interviews and online survey participated by 91 representatives of institutions working on e-mobility)
- 4 policy dialogue events organised
  - Dialogue events organised at the COP, WUF, ITF, several regional fora

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## HIGHLIGHTS OF ACHIEVEMENTS

### Expected Impacts: Reference models of the mobility system to replicate sustainable concepts and the result contributing to key EU policy goals

- 9 demonstration actions implemented with the contribution from European industry partners
- At least 9 project concepts with a high CO<sub>2</sub> mitigation potential submitted to climate finance institutions
- 15 e-mobility business models developed
- 20 replication actions initiated

### Expected Impacts: Contribute to SDGs: SDG 11 "Sustainable cities and communities" and SDG 13 "Climate Action"

- 15 national and local policy action plans developed/adopted by 6/2023
- 15 Local-European partnerships initiated
- 4 finance and business cooperation platforms established
- One international cooperation summary report submitted to the EC

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# Urban Living Lab Center



**UN HABITAT**  
FOR A BETTER URBAN FUTURE

- > The Urban Living Lab Center is the first UN-Habitat collaborating Center.
- > It provides a space for collaboration among implementation-oriented projects in the field of urban basic services and urban climate action.



## PLATFORM FOR URBAN TRANSFORMATIONS

This partnership consists of a joint center of transformative projects and initiatives active in the field of decarbonizing cities and sustainable urban development.

### UN-Habitat Collaborating Center



ULL Center co-hosted by  
**MIT, TU Berlin, and the Wuppertal Institute**



Massachusetts Institute of Technology (MIT)



Technische Universität Berlin



Wuppertal Institute

**Regional Hubs and Thematic Hubs hosted by**  
partner universities and key network partners

in

**Living Lab Cities**

**for capacity building with a focus on:**  
Policy, planning, funding, and financing  
**(public sector)**

Green recovery, business modeling, and start-up support  
**(private sector)**



## Urban Living Lab Center

- ULLC partners host visiting researchers and facilitate external Masters and PhD theses related to urban living labs, e.g. via programmes such as Urban Design, Urban Management and Urban Planning and Mobility
- The Center partners co-develop course curricula for low carbon development for four thematic areas (urban energy, mobility, resources and digitalization) in collaboration with the labs and hubs in the context of new and on-going projects



# Opportunities

- › Integration of case studies, design assignments, analysis etc. from partner cities into courses and theses
- › Internships and research stays at partner cities or companies
- › Study exchanges with partner universities
- › Access to local and national authorities



## AMERICAS

- 1 Escuela Politécnica Nacional, **Ecuador**
- 2 Universidad de Buenos Aires, **Argentina**
- 3 University Pereira, **Colombia**
- 4 Universidad De la Republica Uruguay, **Uruguay**

## EUROPE

- 5 Blekinge Institute of Technology, **Sweden**
- 6 Technical University of Denmark, **Denmark**
- 7 RWTH Aachen University, **Germany**
- 8 Frankfurt University of Applied Sciences, **Germany**
- 9 Technische Hochschule Ingolstadt, **Germany**
- 10 University of Florence, **Italy**

## ASIA

- 11 University of Kathmandu, **Nepal**
- 12 De La Salle University, **Philippines**
- 13 University of the Philippines, **Philippines**
- 14 Asian Institute of Technology, **Thailand**
- 15 Indian Institute of Technology, **India**
- 16 University of Transport Technology, **Vietnam**

## AFRICA

- 17 University of Rwanda, **Rwanda**
- 18 Cape Town University, **South Africa**
- 19 Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development, **Ghana**
- 20 Mohammed VI Polytechnic University, **Morocco**

# Opportunities

- › Co-development of thesis topics with international experts
- › Internships and research stays at Thematic Hubs
- › Contributions to ongoing Living Labs in collaborative projects
- › Access to data, surveys and assessments for joint research linked to theses



UN HABITAT  
Sustainable Cities and Communities

## Mobility

The Mobility Hub is hosted by the Urban Electric Mobility Initiative – a UN-Habitat Action Platform.

[More Infos](#)



Massachusetts  
Institute of  
Technology

## Education

The Education Hub is hosted by the Massachusetts Institute of Technology.

[More Infos](#)



## Digitalisation

The Digitalisation Hub is hosted by UNITAC Hamburg.

[More Infos](#)



CLEAN AIR  
ASIA

## Clean Air

The Clean Air Hub is hosted by Clean Air Asia.

[More Infos](#)



## Climate

The Climate Hub is hosted by UN Environment.

[More info](#)



## Planning

The Planning Hub is hosted by the Technical University Berlin.

[More Infos](#)



## Energy

The Energy Hub is hosted by ICLEI.

[More info](#)



## Governance

The Governance Hub is hosted by the Wuppertal Institute.

[More Infos](#)

2023 Polis Conference

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**THANK YOU**

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