E-MOBILITY FOR UNITED SMART CITIES
CLEAN SOLUTIONS FOR URBAN MOBILITY

suggestions for e-mobility indicators
by Austrian Mobile Power – The e-mobility alliance
Heimo Aichmaier, Managing Director
www.austrian-mobile-power.at
TODAY 7:50AM
E-MOBILITY

CLEAN SOLUTIONS FOR LIVEABLE CITIES
<table>
<thead>
<tr>
<th>UNITED SMART CITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFRASTRUCTURE CONSTRUCTION</td>
</tr>
<tr>
<td>INFORMATION AND COMMUNICATION TECHNOLOGIES</td>
</tr>
<tr>
<td>ENERGY</td>
</tr>
<tr>
<td>URBAN MOBILITY</td>
</tr>
<tr>
<td>GREEN HOUSING AND FACILITIES TECHNOLOGIES</td>
</tr>
<tr>
<td>SAFTY AND SECURITY</td>
</tr>
<tr>
<td>URBAN DEVELOPMENT SERVICE</td>
</tr>
<tr>
<td>HEALTH INFRASTRUCTURE</td>
</tr>
<tr>
<td>FINANCIAL INSTITUTIONS</td>
</tr>
<tr>
<td>RECYLING AND WASTE MANAGEMENT</td>
</tr>
</tbody>
</table>
UNITED SMART CITIES AGREEMENT

ORGANIZATIONS CHOOSE 3 PROJECTS OUT OF 3 DIFFERENT THEMATIC FIELDS

<table>
<thead>
<tr>
<th>Projects</th>
<th>UN</th>
<th>Corporate</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B1</td>
<td></td>
<td>1C1</td>
<td></td>
</tr>
<tr>
<td>1A1</td>
<td>1B2</td>
<td>1C2</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>1Bx</td>
<td>1Cx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2A</td>
<td></td>
<td>2B</td>
<td>2C</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>3A</td>
<td>3B</td>
<td>3C</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

- URBAN MOBILITY
- INFORMATION AND COMMUNICATION TECHNOLOGIES
- GREEN HOUSING AND FACILITIES TECHNOLOGIES
- ENERGY
- URBAN DEVELOPMENT SERVICE
- INFRASTRUCTURE CONSTRUCTION
- RECYCLING AND WASTE MANAGEMENT
- SAFETY AND SECURITY
- HEALTH INFRASTRUCTURE
- FINANCIAL INSTITUTIONS

E-Mobility for United Smart Cities | June 2015 | 5
<table>
<thead>
<tr>
<th>UNITED SMART CITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFRASTRUCTURE CONSTRUCTION</td>
</tr>
<tr>
<td>INFORMATION AND COMMUNICATION TECHNOLOGIES</td>
</tr>
<tr>
<td>ENERGY</td>
</tr>
<tr>
<td>URBAN MOBILITY</td>
</tr>
<tr>
<td>GREEN HOUSING AND FACILITIES TECHNOLOGIES</td>
</tr>
<tr>
<td>SAFETY AND SECURITY</td>
</tr>
<tr>
<td>URBAN DEVELOPMENT SERVICE</td>
</tr>
<tr>
<td>HEALTH INFRASTRUCTURE</td>
</tr>
<tr>
<td>FINANCIAL INSTITUTIONS</td>
</tr>
<tr>
<td>RECYLING AND WASTE MANAGEMENT</td>
</tr>
</tbody>
</table>
**THE E-MOBILITY ECOSYSTEM**

<table>
<thead>
<tr>
<th>VEHICLES (EVs)</th>
<th>E-Bikes and e-Scooter</th>
<th>Passenger vehicles + Light and heavy duty vehicles + busses</th>
<th>Other Logistic Solutions</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SERVICES (ICT)</th>
<th>Fleet Management Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>[BATTERY SWAP]</td>
<td>[SLOW]</td>
</tr>
<tr>
<td>[SEMI-FAST]</td>
<td>[FAST]</td>
</tr>
<tr>
<td>[INDUCTIVE]</td>
<td>[HYDROGEN]</td>
</tr>
</tbody>
</table>

*Source: [www.proton-motor.com](http://www.proton-motor.com)*  
*Source: [www.focus.de](http://www.focus.de)*  
*Source: [www.fdwl.at](http://www.fdwl.at)*  
*Source: [adacemobility.wordpress.com](http://adacemobility.wordpress.com)*  
*Source: [www.conductix.com](http://www.conductix.com)*  
*Source: [http://blog.doubleslash.de](http://blog.doubleslash.de)*
EXPECTED FUTURE DISTRIBUTION OF INFRASTRUCTURE

**Charging technology**

- **Fast Charging**: > 43kW AC, > 50kW DC
- **Accelerated Charging**: > 20kW AC and/or DC
- **Slow Charging**: > 3.7kW AC

**Anticipated e-charging station distribution**

- **10%**: Application Area 4: Fast Charging in public accessible environment, public areas; parking duration <30min
- **10%**: Application Area 3: Charging in public accessible environment, parking blocks, parking lots, malls; parking duration: 45min to 4h
- **40%**: Application Area 2: Charging in parted environment, e.g. company area, limited users; parking duration >4h
- **40%**: Application Area 1: Charging in private environment, e.g. private carport, garage, individual vehicles; parking duration >6h

Increasing relevance at higher market penetration
Smart property, ownership, vehicles, infrastructures and solutions for E-Mobility

**Property**
- Public or semi-public areas
- Private property

**Vehicles**
- Goods
- Passenger

- Driving
- Parking and Charging
- Light Duty Vehicles
- Heavy Duty Vehicles
- Public Transport
- Private vehicles & company fleets
STAKEHOLDER AND USECASES

(Semi-) Public Transport
- e-Busses
- e-Shuttlebusses
- e-Taxis
- e-Carsharing

Public Authorities
- Communal fleets
- Executive fleets
- Garbage collectors

Business
- Trade and Commerce
- Parcel and Express Services
- Home Care and Delivery Services

Private
- Commuting
- Shopping
- Leisure
A smart city should

- ensure access to adequate and affordable housing
- provide access to safe, affordable and sustainable transport systems
- enhance inclusive and sustainable urbanization
- safeguard the world’s cultural and natural heritage
- reduce the number of deaths, displacement and losses caused by disasters
- reduce their environmental impact
- provide universal access to safe and accessible green and public spaces
- support positive economic, social and environmental links between urban and rural areas
- integrate innovative technologies and ICT within the different sectors

source: UNECE

e-mobility as very smart transport solution!
THE CITY WE NEED IS...

- a healthy city. The city’s parks and gardens are havens of peace and tranquility and harbor local flora and fauna and biodiversity. All public and private entities providing public services (water, waste, energy, transport) work together with the city’s residents and have public and environmental health as a common performance indicator.

source: UNHABITAT, „The city we need“

e-mobility as hygienic factor in cities!
E-MOBILITY CRITERIA FOR UNITED SMART CITIES

- Policies
- E-Vehicles
- Infrastructure
- Services
- Education

The e-mobility alliance
**Policies Criteria (1A/5)**

### United Smart Cities Implement Innovative Guidelines

- Create an “E-Mobility Roadmap“ considering an systemic approach (e-vehicles, infrastructure and services)
- Voluntary commitment to be role model for e-mobility:
  - use EVs in public fleets
  - provide intelligent charging infrastructure close to public buildings

### United Smart Cities Are Setting Legal Rules

- Set clear regulations preferring the use of EVs
- Set clear regulations for the implementation of all demand based variations of intelligent loading infrastructures in public and private areas

### Policies Criteria

<table>
<thead>
<tr>
<th>Share of EVs in Public Fleets (&gt;20%) [%]</th>
<th>Ad hoc accessibility [%] easy accessibility to charging infrastructures provided by authorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV privileges [Yes/No] Set up at least 3 local EV privileges in accordance with transport policy</td>
<td></td>
</tr>
<tr>
<td>Infrastructure permission duration [days] Set up easy and supportive implementation and operation rules in public and private areas for loading infrastructure (duration of permission process &lt;2 months)</td>
<td></td>
</tr>
</tbody>
</table>
POLICIES CRITERIA (1B/5)

United Smart Cities implement Intelligent Policy Instruments

- Provide (temporarily, technology-neutral and non-contradictory) tax exemptions, direct subsidies and non-fiscal benefits for the use of EVs
- Provide incentives for private and public interoperable and intelligent infrastructures according to clear criteria like ad hoc-accessibility or national charging spot registers

Monetary incentives [$/cap]

Local intelligent (monetary) incentives for EVs and loading infrastructures for commercial (and private) use

United Smart Cities communicate Good Practices

- Report the development of e-mobility (in accordance with general criteria) annually
- Share actively knowledge
- Publish success stories

- EV stock [no/inh]
  Annual report on all EV subcategories (BEV, PHEV, REEV/REX, FCEV)
- Charging infrastructure stock [no/EV]
  Annual report for intelligent and interoperable charging infrastructure

E-Mobility for United Smart Cities | June 2015
Consider all electrified driven vehicles (EVs):

- BEV: Battery Electric Vehicles
- REEV: Range Extender Electric Vehicles
- PHEV: Plug-in Hybrid Electric Vehicles
- FCEV: Fuel Cell Electric Vehicles

**United Smart Cities promote all kinds of electrified vehicles**

**United Smart Cities fulfill 20% EVs 2020**

Set clear targets for the share of EVs

- Goals for 2020:
  - 20% of new registered cars are EVs
  - 1% EV-share in public transport
  - 50% EV-share in public fleets
  - 10% EV-share in logistic fleets
  - 20% EV-share of newly registered private vehicles by 2020

**Growth of newly registered EVs [%/a]**

*EVs are all partly- or full electrified single- or double lane vehicles below 75 g CO₂/km and a maximum of 25 km electric range*

**EV fleet indicator [%]**

*Set up local goals in accordance to the local transport policy*
### INFRASTRUCTURE CRITERIA (3/5)

**United Smart Cities foster intelligent charging infrastructure**

- Parking operators must implement a reasonable number of user-required charging solutions (Slow, semi-fast and fast infrastructures in public and private areas)
- All public and semi-public charging infrastructures must provide operator independent (ad-hoc) access

**United Smart Cities support implementing intelligent infrastructure**

- Required functionalities of charging infrastructures:
  - ensure a reliable search and find system is available
  - authorization and payment must be a standard towards interoperable infrastructures (booking and payment)

- National register for intelligent charging infrastructures (along technical criteria) [Yes/No]
- Local charging spot maps [Yes/No]
- Charging Infrastructure Interoperability index [„roaming“/local charging]

**Share of charging stations in public areas**

[Share of infrastructures/EV per district]
United Smart Cities promote the use of international IDs

- Standardized identifications for e-mobility provider and charge point operator must be used for their services in public and semi-private areas
- Intelligent infrastructure is mandatory and provides intelligent access and payment solutions on the basis for interoperable infrastructures

United Smart Cities stimulate innovative e-mobility services

E-vehicles as additional and integrated service to public means of transport, like
- company e-vehicle-sharing
- free floating e-car-sharing

National ID-codes [Yes/No]

Set up a national ID-system along international industrial standards for charge point operators and e-mobility providers (along eMI3 standards)

- EV-Sharing indicator [EVs/conventional vehicles]
- Availability of e-vehicle-sharing [Yes/No]
**EDUCATION CRITERIA (5/5)**

**United Smart Cities educates smart citizens for future**

<table>
<thead>
<tr>
<th>Active support for</th>
</tr>
</thead>
<tbody>
<tr>
<td>school and university education</td>
</tr>
<tr>
<td>extended vocational training</td>
</tr>
<tr>
<td>certification of experts</td>
</tr>
<tr>
<td>research and development</td>
</tr>
<tr>
<td>mobility behavior <em>(ASI: avoid, shift, improve)</em></td>
</tr>
</tbody>
</table>

---

**United Smart Cities supports R&D for e-mobility**

<table>
<thead>
<tr>
<th>Active support by</th>
</tr>
</thead>
<tbody>
<tr>
<td>subsidies</td>
</tr>
<tr>
<td>living labs</td>
</tr>
<tr>
<td>innovation-friendly regulation</td>
</tr>
<tr>
<td>public procurement rules at an early stage</td>
</tr>
</tbody>
</table>

---

**E-Mobility education index [Yes/No]**

*Set up education and qualification plans and courses for e-mobility within the existing education system*

**E-Mobility R&D share [e-mobility $/mobility $]**

*Amount of R&D spendings for vehicles, infrastructure and services compared to transport R&D spendings*

**E-mobility R&D indicator [% of GDP]**

*Set up specific R&D initiatives for e-mobility*
UNITED electrified SMART CITIES
Dipl.-Ing. Heimo Aichmaier
Geschäftsführer

Austrian Mobile Power
Mariahilfer Straße 103/4/66
1060 Wien
M: +43 664 8304307
E: heimo.aichmaier@austrian-mobile-power.at


www.austrian-mobile-power.at