E-Mobility and vRE

Northeast Electric Mobility Conclave
30 October 2019, Guwahati

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GIZ GmbH
E-mobility is one of several pieces towards decarbonization.

**TRANSPORT TRANSFORMATION**
This large-scale transformation will ensure that transport is carbon neutral by 2050.

**MOBILITY TRANSITION**
The transition to sustainable mobility will reduce energy consumption without limiting mobility.

**ENERGY TRANSITION IN TRANSPORT**
The transition to clean energy in the transport sector will cover remaining demand with carbon-neutral energy.

Source: Agora Verkehrswende
It requires both mobility transition and energy transition in transport.

GHG reductions by more than 60% can only be reached with the energy transition in transport.

Source: Agora Verkehrswende
Amount of renewable energy required for various powertrain and fuel combinations (per 100 km)

- **15 kWh**: Battery electric vehicle + direct charging
- **31 kWh**: Fuel-cell vehicle + hydrogen
- **93 kWh**: Combustion engine vehicle + power-to-gas
- **103 kWh**: Combustion engine vehicle + power-to-liquid

Source: Agora Verkehrswende, based on calculations by DLR, Ifeu, LBST, DFZ (2015)
Station layout of the standard SRRA stations

- Pyrheliometer (ISO 1st class)
- Pyranometers (ISO 2nd std.)
- temperature
- humidity
- pressure
- rain
- wind

1 min averages
fully autonomous
data transfer via GSM/GPRS

Example: SRRA station at Sadodar
Solar Radiation GHI in kWh/m²/year (derived from 16 years data)

Guwahati: 1526
Silchar: 1617
Assam Energy Action Plan aims to assist Government of Assam in developing and operationalizing an Energy Action Plan

This assignment is being carried out with the following objectives:

- Develop and define the long-term Energy Vision for the state
- Identify key Goals and Objectives to contextualize the Energy Vision
- Develop an Energy Plan and an Energy Action Plan to meet the Goals and Objectives
- Engage with stakeholders throughout the planning process to ensure local ownership
- Build local capacity for doing future Energy Planning and Modeling

3 Main Components

**ENERGY VISION** (Jun 18–Oct 18)
- Vision statement
- Goals
- Objectives

**ENERGY PLAN** (Aug 18–Jan 19)
- Energy Database
- Base-year assessment
- Alternate Scenarios assessment
- Decision support Tool

**ENERGY ACTION PLAN** (Dec 18–Mar 19)
- Interventions
- Roles and responsibilities
- Estimation of Investment
- Phasing of interventions
- Plan for Monitoring
Project Management Structure involves Government of Assam at both the strategic steering level (through PMU) and operational steering (through PIU).

- GIZ is supporting the technical assistance
- Project Management Unit (PMU) is the project steering committee
- Project Implementation Unit (PIU) is the project working committee (NRE department, APDCL)
- Team of ICF, IORA and IIT Guwahati will provide the technical and capacity building assistance
## Target for demand sectors …from EAP

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Baseline (2015)</th>
<th>Target for 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooking sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of households using improved cook stoves (as % of total number of households)</td>
<td>Million</td>
<td>0 (0%)</td>
<td>1.25 (13%)</td>
</tr>
<tr>
<td>Number of households using LPG cook stoves (as % of total number of households)</td>
<td>Million</td>
<td>2.3 (33%)</td>
<td>4.9 (51%)</td>
</tr>
<tr>
<td>Number of households using PNG connections (as % of total number of households)</td>
<td>Million</td>
<td>0 (0.5%)</td>
<td>1.4 (15%)</td>
</tr>
<tr>
<td>Number of households using electricity for cooking (as % of total number of households)</td>
<td>Million</td>
<td>0 (0%)</td>
<td>1.45 (15%)</td>
</tr>
<tr>
<td><strong>Transport sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter 5: Number of electric buses (as % of total number of buses)</td>
<td>Thousand</td>
<td>0 (0%)</td>
<td>8 (50%)</td>
</tr>
<tr>
<td>Parameter 6: Number of electric two-wheelers (as % of total number of two-wheelers)</td>
<td>Thousand</td>
<td>0 (0%)</td>
<td>1,000 (53%)</td>
</tr>
<tr>
<td>Parameter 7: Number of electric three-wheelers (as percentage of total number of two-wheelers)</td>
<td>Thousand</td>
<td>0 (0%)</td>
<td>20 (20%)</td>
</tr>
</tbody>
</table>
EV-Key takeaways for Assam (1/2)

Strategies

– To benefit from the Recently announced FAME II, which has no state wise allocation; state need to act swiftly, to overcome the competition from other states

– Need to focus on 2Ws and 3Ws segments; By providing purchase incentives only to the buyers of 2Ws and 3Ws in Delhi and only 3Ws in Kerala; they have laid special focus on these vehicle segments which have ease of implementing advantage

– To encourage electric boats and ferries to make best use of the strong Inland water ways network; Kerala which have similar advantage has targeted for inducting 100 electric ferries by 2020

– Identify the cities for the initial rollout, which helps in focussed effort creating a visible impact of EVs in the cities; majority of the state policies (Karnataka, Andhra Pradesh, Maharashtra, Kerala, Uttar Pradesh) have identified the cities for the initial rollout

– Attracting the manufacturers of EVs and its components in the state by providing manufacturing incentives which also provides employment opportunities for the local youth
EV- Key takeaways for Assam (2/2)

Action Items

- Formulating State level inter-departmental steering committee which can coordinate among the various departments like Transport, Roads and Buildings, Power / Energy, Finance / Revenue, Planning, Industries, Urban Development, Skill Development; to accelerate the EV adoption.

- Appointing the Nodal Agency to coordinate the rollout of EV charging Infrastructure and set the ceiling for the service charges. The Nodal Agency in Assam could be APDCL.

- The steering committee and the Nodal Agency will evaluate providing incentives to set up charging stations in the initial years which will pave way for scale up. This approach was prime focus of all the other state policies.

- Carryout studies to assess the Impact on distribution network (~150 kW* connected load) due to the EV load growth, and take the reinforcement measures.

- Creating and notifying a separate tariff category for EV charging, in line with the Ministry of Power guidelines

- Building Bye-laws of the state need to be amended in line to the MoUD’s model guidelines, to include EV charging infrastructure in all types of buildings. Delhi has laid down these guidelines in the EV policy document

- Assam needs to amend the open access regulations, to facilitate the charging stations to source power from renewable plants; Delhi has allowed open access to charging service providers, if the aggregated demand is greater than 1MW
Impact assessment of large scale integration of Electric Vehicle Charging infrastructure in the electricity distribution system

BYPL study

- Technology review: Charging processes and impact on power quality
- Load flow simulation on feeders including PV rooftop
- Contributing to Indian regulations
NDC Transport Initiative for Asia

An upcoming regional programme under the International Climate Initiative

On behalf of:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany
# NDC Transport Initiative for Asia (2019-2024)

**Identifying pathways & targets**

<table>
<thead>
<tr>
<th>Component</th>
<th>Action 1</th>
<th>Action 2</th>
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<tbody>
<tr>
<td><strong>India Component</strong></td>
<td>Consolidating transport strategies and EV policies.</td>
<td>1.2: Implementing electromobility powered by RE</td>
</tr>
<tr>
<td>1.1:</td>
<td>Identifying transport targets and mitigation pathways</td>
<td></td>
</tr>
<tr>
<td><strong>China Component</strong>: Integrating low-carbon and clean air strategies.</td>
<td>2.2: Vehicle-related GHG &amp; pollutant emissions regulations</td>
<td></td>
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<tr>
<td>2.1:</td>
<td>Long-term transport policy-package for a Chinese province</td>
<td></td>
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<tr>
<td><strong>Vietnam Component</strong>: Increasing transport ambition in the NDC.</td>
<td>3.2: Design &amp; implementation of clean transport policies</td>
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<tr>
<td>3.1:</td>
<td>Monitoring &amp; enhancing transport targets in climate strategies</td>
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**Implementation of actions**

**Scaling and outreach**

**Global & Asia Component:**

- Further countries enhance ambition in transport
- 4.1: Studies and toolkits inform decision-maker
- 4.2: Regional dialogue puts transport on the agenda
- 4.3: Global awareness for high ambition in transport

**Outcome:** Asian countries put transport on a pathway towards decarbonisation.

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**30/10/2019**

NDC Transport Initiative for Asia
India component

<table>
<thead>
<tr>
<th><strong>WP 1: Integrated decision-making for decarbonizing transport</strong></th>
<th><strong>WP 2: Electromobility powered by renewable energy</strong></th>
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<tr>
<td><strong>Output:</strong> Stakeholder engagement structure is established and informed by comprehensive quantitative analysis</td>
<td><strong>Output:</strong> Policy and procurement frameworks for EVs &amp; charging infrastructure have been improved</td>
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<tr>
<td><strong>Activities:</strong></td>
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</tr>
<tr>
<td>• Stakeholder dialogue</td>
<td>• Charging infrastructure uptake</td>
</tr>
<tr>
<td>• Data &amp; modelling</td>
<td>• EV supply and demand side policies</td>
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<tr>
<td>• Technical support to inform stakeholder dialogue</td>
<td>• EV business models</td>
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</table>
The consortium

- **GIZ (project coordinator):** Service provider on international cooperation for sustainable development. Track record on global and bi-lateral transport and climate change projects of BMU (e.g. TraCS and TRANSfer).

- **WRI:** Think tank with a track record on climate policy and urban mobility. Hosting the NDC-Partnership. Country offices in India and China with high expertise on urban mobility and electromobility.

- **ITF:** Forum of Ministries of Transport, organising the annual International Transport Forum in Leipzig. Strong modelling expertise. Implementing the decarbonising transport project with activities in India.

- **The ICCT:** Think tank focusing on fuel economy policies and energy efficiency of vehicles, incl. electromobility. Representatives based in China and India. Implementing the IKI-funded soot-free bus project.

- **Agora Verkehrswende:** German think tank organising stakeholder dialogue on transforming transport.


- **SLoCaT Partnership:** Partnership of more than 100 transport organisation. Transport focal point of the Marrakech Partnership for Global Climate Action, organising the Transport Day at COPs.
Futuristic themes: Nexus between power supply and e-mobility will be addressed in NDC TIA

- Power Distribution networks must change grid planning and operation: ICT, automation, smart grid, vRE integration
- Load management, DSM, DR
- Using e-vehicle fleet as virtual power plant integrated with vRE, V2G
- Participation in ancillary services for power sector
- Forecasting and scheduling with EV fleet
- Active and optimized charging control for fleet of public charging
- .....
Thank you very much for your attention!

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