

## Renewable Energy Readiness for Decarbonisation of Mobility



### 7th Energy Working Group Meeting

Friday, 05<sup>th</sup> December 2025 | 10 AM

National Institute of Solar Energy  
Gurugram, Haryana, India

### 1. OVERVIEW

Indian surface transport is expecting a significant shift from fossil fuel-based internal combustion engine (ICE) vehicles to electric vehicles (ZET) powered by renewable fuels. Despite alerts about slow adoption, by 2030, key segments may not reach the originally anticipated targets but expected to penetrate: 30% in private cars, 70% in commercial vehicles, 40% in buses, and 80% in two- and three-wheelers, as flagged by NITI Aayog and MoRTH. This is expected to consolidate to an average of 30% overall across all segments. Even under a conservative calculation, if the adoption averages between 15% and 17%, approximately 60.18 million non-ICE vehicles would be on Indian roads by 2030. These vehicles will not require petrol pumps, but rather next-generation energy charging stations.

The 7th Energy Working Group Meeting aims to accelerate the technical and commercial prototyping of 3G Energy Stations for these vehicles and to develop a roadmap for renewable energy adoption to power both green and electric freight highway fleets across India.

### **NHEV Technical Trial Runs (I, II, III) established the viability & bankability of 3G Energy infra.**

Under EoDB 3 technical trials (TTR) were conducted covering commercialization of electric, long-range SUV, e-Bus and Electric Trucks with passengers and commercial load which successfully demonstrated technical and viable feasibility for fleet operators and showed near commercial parity with these large 3G infrastructure for long-haul operations:

- **TTR – I** in 2020 between Delhi & Agra commercially prototyped Electric Bus and Cars for fleet use.
- **TTR – II** in 2022 between Delhi & Jaipur commercially prototyped E Bus and SUV for fleet use.
- **TTR – III** in 2024 between Chennai & Trichy commercially prototyped E Trucks for freight use.
- **TTR – IV** 2026 is scheduled to compare electric charge & swap trucks with hydrogen fuel cell trucks.

### **Real World challenges Vs Strategic Insights to offer solutions**

No energy dispensing infrastructure for mobility has achieved viability, bankability, scalability, or profitability in the past eight years, like NHEV. This calls for careful consideration to further strengthen its movable and immovable assets through the digitalization and optimization of EVs, as well as the assetization and monetization of its EVSE infrastructure.

**INFRA:** Unrealistic expectations and major on-ground implementation challenges, coupled with factors beyond the control of the three key stakeholders in e-mobility—(1) EVSE owners and charge point operators, (2) EVSE OEMs and EV manufacturers, and (3) EV fleet operators—have led to a reluctance in designing any renewable energy transition pathway at this stage. However, this pilot project, adopted by the Government of India, has successfully addressed these significant roadblocks by introducing 3G Energy Stations as co-working spaces for fleet operators and CPOs along national highways and expressways. These stations provide land, infrastructure, power, safety, and footfall, enabling mobility businesses to seamlessly establish and operate their ecosystems within them.



**MOBILITY:** NHEV is currently commercially prototyping Electric trucks from its 3rd Tech Trial, and its 4th Tech Trial is going to compare electric charge & swap trucks with hydrogen fuel cell trucks. 1000 Electric trucks deployment with TRANSVOLT MOBILITY is offering the Ease of Doing Business in a systematic approach for planning, deploying, and operating ZET. These milestones include **Affirmation for adoption**, which gathers end-user's principal interest in ZET deployment. Then, **Route Optimization**, which assesses suitable immovable infra and movable mobility assets for electric freight readiness; **Commercial Equivalence** for ZET significantly accelerates decision making to transit from Diesel; and finally, **ZET Financing and Deployment** by commissioning EV infra & placing orders for vehicle manufacturing concludes this transition.

## 2. VIKSIT BHARAT NATIONAL MASTERPLAN Context

This WGM is being calibrated to deliver a decarbonization pathway to meet this ZET energy demand through prototyping RE by commercially deliberating and prototyping the following:

### **Solar: On-site rooftop capabilities or Off-site solar park feasibility?**

This immediate transition from thermal grid being programmed in WGM to take over the load at the earliest is going to become a must-have for all EV charging infra being deployed across India.

### **Wind: Highway Vertical-Axis Wind Turbines (VAWTs) energy efficiency.**

The overall wind-to-electric efficiency for small VAWTs on highways is often around 10–25% this WGM evaluates various technically and commercially available permutations and combinations to ensure maximum Optimization, Assetization and Monetization of this RE infrastructure on highways.

### **Hydrogen: Dissemination of NTPC H2 pilot insights**

Learnings from the existing Ladakh pilot and the upcoming Yamuna Expressway pilots are being incorporated to develop NHEV 3G energy stations capable of phased storage, generation, and dispensing of hydrogen. This approach ensures that the transport sector does not spend another decade (as it did between 2018 and 2028 for e-mobility) transitioning again—from building electric highways to developing green highways for hydrogen HFC-based mobility.

## 3. Participants of 7<sup>th</sup> WGM

The WGM participants include representatives who closely coordinate among national agencies through institutions or joint task forces comprising members from stakeholders such as NITI Aayog, MoP, MNRE, MoRTH, NHLML, and NHA for policy planning and E-highway upgradations; state governments and DISCOMs for grid readiness and land availability; and private CPOs and LSPs for infrastructure deployment. The WGM also includes participants from vehicle manufacturers, logistics service providers, charge point operators, banks and financial institutions, as well as representatives from think tanks, and national and state-level officials interested in freight decarbonization.

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#### 4. WGM ORDER OF DELIBERATIONS

	Particulars of the Programs
10:00 – 10:30	<b>REGISTRATION   WELCOME   OPENING REMARKS</b>
10:30 – 10:45	<p><b>Welcome Address from Co – Chair</b>  <b>Dr. (SHRI) MOHAMMAD RIHAN</b>            Director General            National Institute of Solar Energy            Ministry of New &amp; RE, Govt. of India            Hon’ble Member - NHEV 3G Energy Working Group</p>
10:45 – 11:00	<p><b>Keynote Address from Convener</b>  <b>Shri Abhijeet Sinha</b>            Program Director            National Highways for Electric Vehicles            National Program Director            Ease Of Doing Business</p>
11:00 – 12:00	<p><b>Introduction of Participant Members to the Chair</b>  <b>Shri Sudhendu Jyoti Sinha</b>            Former Adviser, Infra &amp; EV, NITI Aayog, Govt. of India            Hon’ble Co-Chair, NHEV Knowledge Working Group</p> <p>6th NHEV Energy Working Group Virtual Meeting Recap            Agenda of the 7th Working Group Meeting</p>
12:00– 12:15	<p><b>Station Walkthrough 3D Presentation</b></p> <p><b>Shri Sudhir Malik</b>            Ex CGM - Bharat Petroleum Corporation Limited            Hon’ble Member - NHEV 3G Energy Working Group</p> <p><b>Shri Abhishek Gupta</b>            Program Manager - National Highways for Electric Vehicles            Hon’ble Member - NHEV 3G Energy Working Group</p>
12:15 – 12:30	<p><b>Wind RE Presentation and Considerations</b></p> <p><b>Ms. Swati Maini</b>            Founder - Maini Renewables            Hon’ble Member - NHEV 3G Energy Working Group</p> <p><b>Dr. (Shri) Rajesh Katyal*</b>            Director General            National Institute of Wind Energy</p>

<p><b>12:30 – 12:45</b></p>	<p><b>Hydrogen Presentation and Considerations</b></p> <p><b>Shri DMR Panda</b> Executive Director – Hydrogen NTPC Limited Hon’ble Member - NHEV 3G Energy Working Group</p> <p><b>Shri Ritwick Ghosh</b> Manager (Hydrogen) NTPC Limited</p>
<p><b>12:45– 13:00</b></p>	<p><b>Solar RE Inputs and Considerations</b></p> <p><b>Shri Abhishek Ranjan</b> SVP and Chief Executive Officer BSES Rajdhani Hon’ble Member - NHEV 3G Energy Working Group</p> <p><b>Shri Subrahmanyam Pulipaka</b> Chief Executive Officer National Solar Energy Federation of India</p>
<p><b>13:00 – 14:00</b></p>	<p><b>Open Deliberations and Key Considerations</b></p> <p><b>Dr. (Shri) Abhay Sinha*</b> Director General - SEPC Ministry of Commerce &amp; Industry, Govt. of India Hon’ble Member - NHEV 3G Energy Working Group</p> <p><b>Shri Jaxay Shah*</b> Chairperson Quality Council of India (QCI) Govt. of India</p> <p>Final Takeaway for next WGM <b>Way Forward to INDIA ENERGY WEEK GOA   January 2026</b></p>
<p><b>14:00 – 14:15</b></p>	<p>Valedictory Address by Chair's Concluding Remarks</p> <p><b>Shri Sudhendu Jyoti Sinha</b> Former Adviser, Infra &amp; EV, NITI Aayog, Govt. of India Hon’ble Co-Chair, NHEV Knowledge Working Group</p>
<p><b>14:15 onwards</b></p>	<p><b>Networking Lunch &amp; NISE Campus Visit</b></p>

## 5. WGM FORMAT & DECISION MAKING

This WORKING GROUP takes up critical agenda for deliberations and concludes them in the following format, which further gets documented as minutes for publication and implementation:

FORMAT	Subjects being brought under consideration for the 7th WGM to
<b>High Impact Empowered Working Group</b>	<p><b>To Describe</b> Approximately 20 critical matters are brought on Agenda for consideration and recommendation before the 7th Working Group Meeting.</p> <p><b>To Deliberate</b> Presentations, Deliberations, Considerations, Q&amp;A in the meeting before WGM takes final decision on way forward for the concern tabled.</p> <p><b>To Decide</b> Recommendations to be published for wider consultation, Matter Classified for interministerial consideration exclusively, Decision taken by voting / voice of majority in favor or against.</p>
<b>Documentation</b>	<ul style="list-style-type: none"> <li>• Recommendations Documented for execution</li> <li>• Published after defect proofing for stakeholders</li> <li>• Minutes shared for any additional mention</li> </ul>

KEY CONSIDERATIONS	Short Description of subject / matters taken on schedule for the 7th WGM
<b>1.</b>	NHEV 3G Energy Stations to replace Diesel gensets with hydrogen gensets.
<b>2.</b>	Sequence in phased manner genset, storage, generation then dispensing.
<b>3.</b>	Recommendations from WGM to bring more alignment with NGHM.
<b>4.</b>	What is expected from NHEV to learn from upcoming NTPC deployment.
<b>5.</b>	Deliberations on possible ways to finance H2 transition as RE input in NHEV.
<b>6.</b>	Deliberations on technically and commercially available permutations and combinations to ensure maximum Optimization, Assetization and Monetization of WIND as RE input of NHEV 3G stations.
<b>7.</b>	Decision on megawatt charging by Solar RE input arrangement from alternatives: 1. <b>Onsite &amp; rooftop capabilities</b> OR      2. <b>Wheeling from Off-site solar park?</b>
<b>8.</b>	Deliberations on compartmentalised Safety protocols of each energy components to be designed and prototyped together for PESO licencing; allowing a multifuel modular arrangement to meet various non fossil fuel demand of green mobility.
<b>9.</b>	Recommendation to introduce a Common Connected Commercial Vehicle Protocol for all ZET vehicle be it electric or hydrogen to Network Working Group.
<b>10.</b>	<b>DELHI CRISIS:</b> Recommendation for considerations of 5 NHEV 3G Energy stations on Delhi Entry points Ghaziabad, Faridabad, Noida, Gurugram & Sonipat capable to host electric trucks to eliminate diesel truck entry in city reducing significant smoke; by commissioning to be preponed from 2028 to 2026 in an aggressive mission mode.

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11.	Recommendations to extend budgeted <b>National Infra Development</b> financial support for states to accelerate their DISCOM's readiness to join this nationwide energy transition meeting mobility demand from RE.
12.	Inclusivity and availability of <b>Battery Energy Storage System (BESS)</b> related recent ministerial guidelines for commissioning a commercial <b>BAAS model</b> at stations.
13.	Participant's interest to join the <b>Blended Climate Financing</b> instrument for Union Budget input on climate finance taxonomy in March 2026.
14.	International references for consideration while planning Indian 3G version.
15.	Identification of critical roadblocks to implement it at 270 stations and 5000 kms. Immediate RE availability to power 1000 heavy duty electric trucks energy infra.
16.	WGM Recommendations on guiding principles for Procurement and Selection criteria based on Merit, Productivity and Performance at prototype level.
17.	Early capitalizations of support from <b>Carbon Markets</b> to incentivise this transit.
18.	Need of Vital and necessary publications allocations, timelines and partnerships. Synergy to partner with all national stakeholders at IEW – 2026.
19	Megawatt Compact Sub Stations and Balancing energy spectrum for efficiency.
20.	Energy Working Group of 20 members to choose Chair & Co-Chair organisations.

#	Committee Members	Current honorary Positions and Parent Organisations
1.	<b>Dr (Shri) Mohammad Rihan</b>	Member NHEV Energy Working Group Director General - National Institute of Solar Energy (NISE)
2.	<b>Dr (Shri) Abhay Sinha</b>	Member NHEV Energy Working Group Director General - Services Export Promotion Council (SEPC)
3.	<b>Shri Amitabh Sinha</b>	Member NHEV Energy Working Group Head of Growth - Institution of Engineering and Technology (IET)
4.	<b>Shri D.M.R. Panda</b>	Member NHEV Energy Working Group Executive Director – Hydrogen - NTPC Limited
5.	<b>Shri Abhishek Ranjan</b>	Member NHEV Energy Working Group Chief Executive Officer - BSES Rajdhani
6.	<b>Shri Jaxay Shah</b>	Chairperson - Quality Council of India (QCI), Gol. Nominated Member, NHEV Energy Working Group
7.	<b>Shri Friederich Kupzog</b>	Member NHEV Energy Working Group Head of Centre for Energy - Austrian Institute of Technology (AIT)
8.	<b>Shri K. N. Hemanth</b>	Member NHEV Energy Working Group Director E- mobility - International Copper Association India
9.	<b>Shri Sudhir Malik</b>	Member NHEV Energy Working Group Ex-CGM - Bharat Petroleum Corporation Limited
10.	<b>Shri Subrahmanyam Pulipaka</b>	Chief Executive Officer - National Solar Energy Federation of India Participant – 7 <sup>th</sup> Working Group Meeting (Energy) from NHEV
11.	<b>Shri Arth Patel</b>	Member NHEV Energy Working Group CEO - Tirex Chargers
12.	<b>Shri Kaushik Basu</b>	Member NHEV Energy Working Group Associate Professor - Indian Institute of Science (IISc)
13.	<b>Shri Krishna Chaitanya Reddy</b>	Member NHEV Energy Working Group Assistant General Manager - Aisin Automotive   Gurugram, India
14.	<b>Shri Martin Mesmer</b>	Member NHEV Energy Working Group CEO - Surya Charge LLP
15.	<b>Shri Pradeep Kumar Verma</b>	Member NHEV Energy Working Group Managing Director - Accord Transformer and Switchgear
16.	<b>Shri Ronak Bhatt</b>	Member NHEV Energy Working Group GM - Technical Cell & Product Management - RR Kabel
17.	<b>Ms. Swati Maini</b>	Member NHEV Energy Working Group Founder - Maini Renewables
18.	<b>Shri Vishnu Prasad</b>	Member NHEV Energy Working Group Head of R&D - Lakshmi Electrical Control System
19.	<b>Shri Binu S. Pillai</b>	Member NHEV Energy Working Group Director - Lotus Wireless Technologies
20.	<b>Shri Abhishek Gupta</b>	Member NHEV Energy Working Group Program Manager - Ease of Doing Business