

**GOVERNMENT OF INDIA  
MINISTRY OF SCIENCE AND TECHNOLOGY  
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH  
LOK SABHA  
STARRED QUESTION No. \*68  
(ANSWERED ON 04.02.2026)**

**INDIGENOUS DEVELOPMENT OF BIO-BITUMEN FROM THE STUBBLE**

**\*68. Shri Sudheer Gupta:**

**Shri Chavan Ravindra Vasantrao:**

**Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:**

- a. Whether Council of Scientific and Industrial Research (CSIR) and Central Road Research Institute (CRRI) have developed the technology to develop Bio-bitumen from the stubble indigenously and if so, the details thereof;**
- b. The amount likely to be saved by the Government which is incurred on import of petro bitumen;**
- c. Whether the Government has issued the licence for commercial manufacturing of bio-bitumen to 14 private companies;**
- d. If so, the details thereof and the terms and conditions of such technology transfer; the likely impact of the adoption of bio-bitumen on cost reduction, import substitution, carbon emissions and rural/ agricultural waste utilisation; and**
- e. The steps taken by the Government to promote large-scale adoption, quality standards and commercial viability of bio-bitumen across the country?**

**ANSWER**

**MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE  
MINISTRY OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES**

**(DR. JITENDRA SINGH)**

**(a) to (e): A Statement is laid on the Table of the House.**

**STATEMENT REFERRED TO IN REPLY TO PART (A) TO (E) IN RESPECT OF LOK SABHA STARRED QUESTION NO. \*68 FOR REPLY ON 04.02.2026 REGARDING INDIGENOUS DEVELOPMENT OF BIO-BITUMEN FROM THE STUBBLE ASKED BY SHRI SUDHEER GUPTA AND SHRI CHAVAN RAVINDRA VASANTRAO:**

a.	<p><b>Yes. Council of Scientific and Industrial Research (CSIR), through its constituent laboratories namely, CSIR-Central Road Research Institute (CSIR-CRRI), New Delhi and CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun, has jointly developed an indigenous technology to produce bio-bitumen from agricultural residue (notably rice straw) by pyrolysis. The process converts crop residue into bio-oil via pyrolysis which is subsequently upgraded through chemical processing and blended/modified to produce a bio-binder suitable for use in bituminous roads.</b></p>
(b)	<p><b>Bio-bitumen developed indigenously has the potential to partially replace conventional petroleum-based bitumen without compromising pavement performance. Studies and pilot-scale evaluations indicate that bio-bitumen can replace up to 30 per cent of conventional bitumen. Even at a conservative blending level of 15 per cent, the adoption of bio-bitumen across road projects in the country is estimated to result in foreign exchange savings of approximately ₹4,000 crore per annum through reduction in petro-bitumen imports. However, the actual savings will depend on blending ratio, availability of feedstock, and extant market prices.</b></p>
(c) & (d)	<p><b>Yes. The developed technology has been transferred on a non-exclusive basis to 14 industries from different parts of the country for commercial manufacturing and scale-up on 7<sup>th</sup> January 2026. The technology transfer, <i>inter alia</i>, includes provisions relating to payment of upfront technology transfer fees (premia) and royalties, adherence to prescribed technical specifications and quality standards, protection of intellectual property rights, confidentiality obligations, and compliance with the scope and conditions stipulated in the licence agreements. The details of the 14 licensees is at Annexure-I.</b></p> <p><b>The likely impact of the adoption of bio-bitumen on cost reduction, import substitution, carbon emissions and rural/agricultural waste utilization is as under:</b></p>

- **Cost reduction and import substitution:** Partial replacement of petroleum bitumen with domestically produced bio-binder reduces the volume of imported bitumen required thereby result in foreign exchange savings for the country.
- **Reduction in carbon emissions:** Adoption of bio-bitumen is expected to result in a significant reduction in carbon emissions compared to conventional petroleum-based bitumen. Bio-bitumen is derived from renewable agricultural biomass, and its partial substitution for petro-bitumen reduces the consumption of fossil fuels and the associated lifecycle greenhouse gas emissions. In addition, utilisation of agricultural residues such as crop stubble for bio-bitumen production helps prevent open-field burning, which is a major source of carbon dioxide, particulate matter, and other air pollutants. The diversion of biomass from open burning to productive use, therefore, leads to both direct and indirect reductions in carbon emissions.
- **Rural/agricultural waste utilisation:** Use of rice straw and crop residue as feedstock creates an economic use for agricultural waste, opening new value-chains (collection, transport, pyrolysis units) in rural areas. This could provide additional income streams to farmers and rural entrepreneurs and reduce the need to burn stubble.

(e) **To enable nationwide production and supply, the developed technology has already been transferred to 14 industries from different regions of the country on a non-exclusive basis to facilitate decentralized manufacturing and commercial scale-up. Further, CSIR-CRRI is working with the Ministry of Road Transport and Highways (MoRTH) to evaluate long term performance of Bio-bitumen roads to draft standards and specifications for Bio-bitumen. In addition CSIR-CRRI is also working with the Bureau of Indian Standards (BIS) for the formulation of material specifications, test protocols and usage guidelines to ensure uniform quality, safety and long-term performance of bio-bitumen in road construction.**

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<b>S. No.</b>	<b>Company Name</b>	<b>City</b>	<b>State</b>
<b>1</b>	<b>Bitumenking India Private Limited</b>	<b>Patiala</b>	<b>Punjab</b>
<b>2</b>	<b>Catalyst Petrochem LLP</b>	<b>Delhi</b>	<b>Delhi</b>
<b>3</b>	<b>Engrow Carbon Energy Private Limited</b>	<b>Erode</b>	<b>Tamil Nadu</b>
<b>4</b>	<b>Future Universal Petrochem Private Limited</b>	<b>Yamuna Nagar</b>	<b>Haryana</b>
<b>5</b>	<b>Jalnidhi Bitumen Specialities Private Limited</b>	<b>Kolkata</b>	<b>West Bengal</b>
<b>6</b>	<b>Kotak Nova Green Energy LLP</b>	<b>Jamnagar</b>	<b>Gujarat</b>
<b>7</b>	<b>Negam Care Private Limited</b>	<b>Namsai</b>	<b>Arunachal Pradesh</b>
<b>8</b>	<b>Neptune Petrochemicals Limited</b>	<b>Ahmedabad</b>	<b>Gujarat</b>
<b>9</b>	<b>Nexxus Petro Industries Limited</b>	<b>Ahmedabad</b>	<b>Gujarat</b>
<b>10</b>	<b>Ooms Polymer Modified Bitumen Private Limited</b>	<b>Gurugram</b>	<b>Haryana</b>
<b>11</b>	<b>Rex Fuels Management Private Limited</b>	<b>Mumbai</b>	<b>Maharashtra</b>
<b>12</b>	<b>RK Truevalue LLP</b>	<b>Mumbai</b>	<b>Maharashtra</b>
<b>13</b>	<b>Terra Climate Tech Private Limited</b>	<b>Jaipur</b>	<b>Rajasthan</b>
<b>14</b>	<b>VR Petrochem India LLP</b>	<b>Vadodara</b>	<b>Gujarat</b>