

## The Hindu Important News Articles & Editorial For UPSC CSE

**Wednesday, 28 Jan, 2026**

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After nearly two decades of intermittent negotiations, India and the European Union (EU) have concluded what has been described as India's largest-ever Free Trade Agreement. Termed the "mother of all deals", the FTA covers trade in goods, services, investment facilitation, sustainability, and strategic cooperation. The agreement is significant not only for its economic scale—covering two economies that together account for nearly one-third of global trade—but also for its geopolitical relevance amid global trade fragmentation and supply chain disruptions.

## 'Mother of all deals': India and the EU finalise FTA

European wines, luxury cars to become cheaper as two sides conclude trade negotiations that began in 2007

Modi calls it historic pact, while EU chief says the deal will reduce strategic dependency at a time of global upheaval

Officials say document will undergo a legal scrubbing, translation before ratification by European Parliament

**T.C.A. Sharad Raghavan**  
NEW DELHI

After almost two decades of negotiation, India and the European Union (EU) finalised a free trade agreement (FTA) on Tuesday, billed as the "mother of all deals", that will see the EU drop tariffs on 99.5% of Indian exports to the 27-nation bloc.

India has given tariff concessions on 97.5% of imports from the EU, with European wines and luxury cars set to become less expensive here as a result.

Beyond the economics, both sides stressed the geopolitical significance of a deal between two economies that together account for a third of global trade in the shadow of uncertainty sparked by the U.S. tariff regime.

Prime Minister Narendra Modi declared that the partnership would "strengthen stability" at a time of global turmoil, while European Commission President Ursula von der Leyen said it would reduce strategic dependency at a time when global trade is increasingly fractious.

"We have delivered the mother of all deals," she said. "Two giants who choose partnership, in a

true win-win fashion. A strong message that cooperation is the best answer to global challenges."

### 'Largest-ever FTA'

Noting that this is India's largest-ever FTA, Mr. Modi said: "This historic agreement will facilitate access to the European market for our farmers and small industries, create new opportunities in manufacturing, and strengthen cooperation in our services sectors."


Both sides, however, made sure to exclude their respective sensitive sectors. India's strategic agricultural and dairy sectors remain protected, while the EU will maintain its current tariffs on beef, sugar, rice, chicken meat, milk powder, honey, bananas, soft wheat, garlic, and ethanol.

India-EU FTA talks were first launched in 2007. Following several hiccups and pauses, they were resumed in 2022 with both sides agreeing to exclude issues on which agreement had been elusive.

According to Commerce Ministry officials, the language in the document will first be cleaned up over the next 10 to 15 days, following which it will undergo "legal scrubbing". It will

### Landmark agreement

After almost two decades of talks, the European Union and India sealed a landmark trade pact, driven by U.S. tariff pressures. The deal aims at doubling exports to India



**HOW DOES IT BENEFIT EU?**

- Tariffs removed or cut on 90% of EU goods
- Wine duties cut from 150% to 20-30%; Spirits cut to 40%
- Car tariffs drop from 110% to 10% (250,000 vehicle quota)
- Tariffs eliminated on Airbus aircraft, and processed food
- 0% tax on most machinery, and pharmaceutical products

**HOW DOES IT BENEFIT INDIA?**

- Duty-free exports for items such as textiles, leather, gems, and spices
- A duty-free quota of 1.6 million tonnes for steel
- Easier for skilled Indian workers to work in the 27-country bloc
- Dialogue on carbon border tax; India set to be treated like other EU partners
- Phased-out tariffs on arms and ammunition, among other goods

**WHAT THE DEAL DOESN'T INCLUDE?**

- No concessions on items such as chicken and rice
- No agreement on government procurement on energy and raw materials
- A "sustainable development" chapter (rejected by India)
- Agreement on Geographical Indications

**Diplomatic outreach:** Prime Minister Narendra Modi with European Commission President Ursula von der Leyen and Council President Antonio Costa, on Tuesday in New Delhi. ANI

then have to be translated and sent to all 27 EU member states, before it can be ratified by the European Parliament. "We do hope that we should be able to celebrate the entry into force of this agreement within calendar 2026 itself," said Union Minister Piyush Goyal.

According to the Commerce Ministry, India has gained tariff reductions across 97% of tariff lines, covering 99.5% of trade value. Of this, 90.7% of India's exports will see duties eliminated entirely on the first day of the deal's implementation, including labour-intensive sectors such as textiles, apparel, leather, footwear, tea, coffee, spices, sports goods, toys, gems and jewellery, and certain marine products, amongst others.

Another 2.9% of India's exports will see duty elimination over three to five years. This would include certain marine products, processed food items, and arms and ammunition. Over and above this, 6% of India's exports will see tariff reductions including certain poultry products, preserved vegetables, bakery products, amongst others.

"Key labour-intensive sectors comprising more than ₹2.87 lakh crore [\$33 billion] of exports that are currently subjected to import duty between 4% to

26% in the EU and are crucial for employment generation, will enter zero duty from entry into force of the FTA and thus gain enhanced competitiveness in the EU market," the Ministry said in a release.

**Duty elimination**  
In particular, of the sectors that India primarily exports to the EU, the following will see duties eliminated entirely: marine products (current duties of up to 26%), chemicals (12.8% currently), plastic and rubber items (6.5%), leather footwear (17%), textiles and apparel (12% each), base metals (10%), gems and jewellery (4%), furniture and allied consumer goods (10.5%), and toys and sports goods (4.7%). On services, the EU has agreed to commitments across 144 services sub sectors, including IT/ITeS, professional services, education, and other business services.

Overall, India is offering duty elimination and reductions on 92.1% of the tariff lines, which comprises 97.5% of the EU exports to India. Within this, 49.6% of the tariff lines will see an immediate duty elimination once the agreement comes into effect.

Another 39.5% of the tariff lines will be subject to a phased elimination of tariffs over five, seven, and 10 years. An additional 3%

of products will see phased tariff reductions. "Imports of EU's high technology goods are expected to diversify India's import sources, thereby reducing input costs for businesses, benefit consumers and will create opportunities for Indian businesses to integrate into global supply chains," the statement added.

Notably for the EU, the following European sectors will see duty-free access to the Indian markets: machinery and electrical equipment, aircraft and spacecraft, optical, medical and surgical equipment, plastics, precious stones and metals, chemicals, motor vehicles, iron

and steel, pharmaceuticals, and various agricultural products. On services, India has agreed to open up 102 sub sectors covering EU priorities such as professional, business, telecommunications, maritime, financial, and environmental services.

It has been learnt that negotiations over a few sectors such as automobiles and wine had caused some problems, but that the two sides finally agreed to quota based systems that were satisfactory to both sides. India agreed to allow European cars with a price tag above ₹25 lakh to be imported at lower duties of as low as 10%, from the current 110%, but subject to a quota.

India and the EU also reached a limited agreement on the contentious Carbon Border Adjustment Mechanism (CBAM), Mr. Goyal added. The agreement creates a way for carbon footprint verifiers in India to gain accreditation. It also specifies that, should the EU give concessions under CBAM to a third country, those concessions would automatically apply to India too.

**MORE REPORTS ON**  
» PAGES 5, 11, & 12

## Key Features of the Agreement

### 1. Trade in Goods

The EU will eliminate tariffs on 99.5% of Indian exports, with over 90% of exports receiving zero-duty access from day one.

Major beneficiary sectors for India include textiles, apparel, leather, footwear, marine products, gems and jewellery, toys, sports goods, chemicals, plastics, and base metals.

India has offered tariff concessions on 97.5% of EU exports, with phased reductions over 5–10 years for sensitive sectors.

European wines and luxury automobiles will become cheaper in India under quota-based, reduced-duty mechanisms.

## 2. Protection of Sensitive Sectors

India has protected its agriculture and dairy sectors, while the EU has excluded products such as beef, sugar, rice, milk powder, and ethanol from full liberalisation.

This reflects India's cautious approach towards livelihood security and food sovereignty.

## 3. Trade in Services

The EU has opened 144 services sub-sectors for India, including IT/ITeS, professional services, education, and business services.

India has committed to 102 services sub-sectors of interest to the EU, including telecom, maritime, financial, and environmental services.

The deal complements India's strength in skilled manpower with Europe's capital and technology.

## 4. Carbon Border Adjustment Mechanism (CBAM)

A limited but important understanding has been reached on the EU's CBAM, which impacts carbon-intensive exports like iron and steel.

### India has secured:

Recognition of Indian carbon verifiers

Enhanced technical cooperation

A Most-Favoured Nation (MFN)-type assurance, ensuring any CBAM concessions to third countries will automatically apply to India.

## 5. Nuclear and Strategic Cooperation

Parallel to the FTA, India and the EU reaffirmed cooperation under the India-Euratom Agreement, focusing on:

Peaceful uses of nuclear energy

Nuclear safety, security, and non-power applications (e.g., radio-pharmaceuticals)

Collaboration in ITER and research funding under Horizon Europe.

## EU, India to collaborate on 'peaceful uses' of nuclear energy under Euratom deal

**The Hindu Bureau**  
NEW DELHI

The European Union (EU) and India have committed to promoting collaboration on the peaceful uses of nuclear energy under the India-Euratom agreement, according to a statement from the Joint India-European Union Comprehensive Strategic Agenda on Tuesday. India and the EU had signed a research and development agreement on peaceful uses of nuclear energy with Euratom, Europe's atomic energy body, in July 2020.

The statement on Tuesday highlighted collaboration on research and development activities in nuclear science and technology, advanced materials for detectors, radiation safety, nuclear security, non-power applications of atomic energy, including cooperation on radio-pharmaceuticals, and strengthening cooperation in the International Thermonuclear Experimental Reactor (ITER). It also spoke of



Union Minister Piyush Goyal and NSA Ajit Doval with delegates from the European Union in New Delhi on Tuesday. AP

"deepening cooperation" under the EU research and innovation programme, Horizon Europe, including in the fields of energy, water, agri food, health, semiconductors, biotech, advanced materials, particularly through mechanisms such as co-funding and coordinated calls. Horizon Europe is the EU's key funding programme for research.

While specifics are unclear, one of the major sticking points involving the EU and India was the Carbon Border Adjustment Mechanism (CBAM), which imposed additional tariffs on iron and steel producers, outside the EU, who

emit more carbon emissions in the production of iron and steel than European producers.

"Through CBAM provisions, commitments have been secured, including a forward-looking, most-favoured nation assurance, extending flexibilities, if any, granted to third countries under the regulation, enhanced technical cooperation on recognition of carbon prices, recognition of verifiers, as well as financial assistance and targeted support to reduce greenhouse gas emissions and comply with emerging carbon requirements," India's Press Information Bureau said in a statement.



## 6. Geopolitical and Strategic

Prime Minister Narendra Modi the FTA as a stabilising force amidst global turmoil.

European Commission President Ursula von der Leyen emphasised reduced dependency and rules-cooperation.

The deal is complemented by a Defence Partnership, counter-terrorism, maritime cybersecurity, and defence cooperation.

### Significance for India

**Economic:** Enhances export competitiveness, boosts in labour-intensive sectors, India deeper into global

**Strategic:** Diversifies trade beyond over-dependence on any single market and strengthens India's position in a multipolar world.

**Environmental & Regulatory:** Creates a framework to engage with evolving global standards like CBAM rather than confronting them unilaterally.

**Institutional:** Reinforces India's credibility as a reliable, long-term trade partner capable of concluding complex mega trade deals.

### Challenges and Concerns

Adjustment pressure on domestic industries facing European competition, especially in automobiles and high-end manufacturing.

Compliance costs related to environmental and technical standards.

Ratification risks, as the agreement still requires approval by the European Parliament and EU member states.

### Conclusion

# Prime Minister lauds 'ambitious' trade deal with European Union

'Historic' FTA a boost to investment between India and the European Union, says Modi; pact brings together Indian services and skills with European capital and innovations, says EU chief; deal 'opens a whole new world', says Union Home Minister

Kallol Bhattacharjee  
NEW DELHI

India 'concluded' a 'historic' Free Trade Agreement (FTA) with the European Union, Prime Minister Narendra Modi said on Tuesday, announcing the end of negotiations that began nearly two decades ago and were revived in 2022.

Speaking at the end of delegation-level talks with the visiting European leaders – European Commission President Ursula von der Leyen and European Council President Antonio Costa – Mr. Modi said that alongside the 'ambitious' FTA, India was also entering into a new Security and Defence Partnership and a system of mobility that would allow secure and legal movement of Indians to the EU region.

"Today, India has concluded the largest Free Trade Agreement in its history," said Mr. Modi. The two sides began discussions on the trade deal in 2007 but suspended the negotiation in 2013, and the talks were relaunched in 2022 as India and the EU began reorienting policies in the post-COVID-19 scenario. The Prime Minister presented the deal as a



**Coming together:** Prime Minister Narendra Modi, EU chief Ursula von der Leyen, and European Council President Antonio Costa witness the exchange of an MoU in New Delhi on Tuesday. ANI

boost to investment between the EU and India that would support "innovation partnerships and strengthen supply chains at the global level".

The deal would "cut up to €4 billion in annual tariffs for exporters", Ms. von der Leyen said. "It brings together Indian skills, services and scale with Europe's technology, capital and innovation," she added.

Union Home Minister Amit Shah welcomed the FTA and said the deal "safeguards the related sectors" while "opening a whole new world of oppor-

tunities for textiles, apparel, leather footwear, marine products, gems, jewellery, handicrafts, engineering goods, medical instruments and appliances, plastics and automobile sectors."

#### Global uncertainties

Referring to global uncertainties, Mr. Modi said the two sides discussed the conflict in Ukraine, West Asia, and the Indo-Pacific theatre, saying: "In this context, the partnership between India and the European Union will strengthen stability within the international system."

A joint statement issued after the meeting said the two sides would "continue to support efforts towards the achievement of a comprehensive, just and lasting peace in Ukraine through dialogue and diplomacy, based on the principles of the UN Charter and international law, including independence, sovereignty and territorial integrity." It also called for "unhindered humanitarian access" for the victims of Israel-Palestine conflict in the Gaza Strip and called for implementation of the UN Security Council Resolution 2803 of November

17, 2025, that welcomes the 'Board of Peace' for Gaza. The document reiterated the call for "implementation of the two-state solution, through dialogue and diplomacy" for the Israel-Palestine conflict.

Elaborating on the India-EU Security and Defence Partnership, Mr. Modi said: "This will help us work more closely on counter-terrorism, maritime security, and cybersecurity."

The two sides welcomed the launch of talks on a 'Security of Information Agreement' to facilitate the exchange of classified information. Briefing the media about the discussion, Foreign Secretary Vikram Misra said India has defence and security partnerships with "several individual EU member states" already, but this framework agreement on security and defence would "allow Indian defence companies to benefit from opportunities arising from the EU's own very significant defence initiatives that are underway". The European Commission President described the defence and security framework as "a landmark departure and a trust-based platform".

## Dimension

highlighted amid global

Ursula von der Leyen emphasised reduced dependency and rules-based

Security and covering security, industrial

employment and integrates value chains.

partners

## Daily News Analysis

The India–EU FTA marks a transformational milestone in India’s trade diplomacy. Beyond tariff reductions, it symbolises a strategic alignment between two democratic, rule-based economies at a time of global uncertainty. If implemented effectively, the agreement can act as a catalyst for exports, investment, technological collaboration, and strategic autonomy. For UPSC purposes, it stands as a strong example of how trade policy, geopolitics, climate concerns, and strategic partnerships increasingly intersect in contemporary international relations.

### UPSC Prelims Exam Practice Question

**Ques: The Carbon Border Adjustment Mechanism (CBAM), recently discussed in India–EU negotiations, primarily aims to:**

- (a) Promote free trade by eliminating tariffs on carbon-intensive goods
- (b) Impose additional costs on imports based on their carbon emissions
- (c) Provide subsidies to developing countries for green technologies
- (d) Harmonise global carbon taxation systems

**Ans: (b)**

### UPSC Mains Exam Practice Question

**Ques: Analyse the potential impact of the India–EU FTA on India’s labour-intensive sectors. What challenges may arise in its implementation? (150 Words)**



## Page 04 : GS II : International Relations

In a sharply worded intervention at the United Nations Security Council (UNSC), India categorically rejected Pakistan's attempt to frame terrorism and cross-border actions as a "new normal" in international relations. Responding to remarks by Pakistan during a UNSC open debate on "Reaffirming international rule of law", India asserted that terrorism cannot be normalised and accused Pakistan of using it as an instrument of state policy. The statement reflects India's consistent diplomatic posture on cross-border terrorism and its effort to shape global norms on accountability.

### Background of the Issue

The exchange took place during a UNSC open debate on international rule of law.

Pakistan raised issues related to Operation Sindoor, Jammu and Kashmir, and the Indus Waters Treaty, attempting to project India as destabilising regional peace.

India responded through its Permanent Representative, Parvathaneni Harish, countering Pakistan's narrative as "false and self-serving".

### India's Core Arguments

#### 1. Terrorism Cannot Be a 'New Normal'

India strongly rejected Pakistan's assertion that there should be "no new normal based on coercion or impunity."

India clarified that the real abnormality is the continued tolerance of terrorism, particularly when it is backed by state policy.

The statement reinforced India's long-standing position that no political or strategic justification can legitimise terrorism.

#### 2. Pakistan's Conduct at the UNSC

India pointed out that Pakistan, despite being an elected UNSC member, uses international platforms with a single-point agenda to target India.

India warned against allowing the UNSC to become a forum for legitimising terrorism under diplomatic rhetoric.

#### 3. Right to Self-Defence

India asserted its sovereign right to take all necessary measures to protect the life and security of its citizens.

This aligns with international law principles, including the right to self-defence against non-state actors supported by states.

## Not normal to tolerate Pakistan's use of terror: India

**Press Trust of India**  
UNITED NATIONS

In a strongly worded retort in the UNSC, India said it is not normal to tolerate Pakistan's continued use of terrorism as an instrument of state policy, as New Delhi hit back at Islamabad's envoy for advancing a "false and self-serving" account of Operation Sindoor.

India's Permanent Representative to the UN, Ambassador Parvathaneni Harish, delivered a sharp response to comments made by Pakistan's Ambassador to the UN, Asim Iftikhar Ahmad.

Mr. Ahmad spoke about Operation Sindoor, Jammu and Kashmir and the Indus Waters Treaty in his remarks at the UN Security Council open debate on Monday on "Reaffirming international rule of law: pathways to reinvigorating peace, justice, and multilateralism".

Mr. Harish said Pakistan, an elected member of the Security Council, has a single-point agenda – to harm India and its people.

With Mr. Ahmad telling the Council that Pakistan's response to Operation Sindoor "established that

**Terrorism can never be normalised as Pakistan wishes to do, says Ambassador Parvathaneni Harish**

there can be no 'new normal' based on coercion or impunity", Delhi slammed Islamabad, with Mr. Harish asserting that terrorism can never be normalised as Pakistan wishes to do.

"We have heard talk from the Representative of Pakistan about the new normal. Let me reiterate again that terrorism can never be normalised as Pakistan wishes to do. It is not normal to tolerate Pakistan's continued use of terrorism as an instrument of state policy," Mr. Harish said.

He added that India will do whatever is required to protect and ensure the safety and security of its citizens.

"This hallowed chamber cannot become a forum for Pakistan to legitimise terrorism," Mr. Harish said.

Mr. Harish said Pakistan's envoy "advanced a false and self-serving account" of Operation Sindoor.

#### 4. Questioning Pakistan's Credibility

India dismissed Pakistan's account of Operation Sindoor as misleading.

The rebuttal implicitly highlights Pakistan's credibility deficit due to its past record of terror financing and sheltering extremist groups.

#### Significance for India

##### Diplomatic Significance

Reinforces India's narrative of being a victim of cross-border terrorism, not an aggressor.

Counters Pakistan's repeated attempts to internationalise bilateral issues like Kashmir.

##### Normative Significance

Strengthens the global discourse that terrorism cannot be contextualised or selectively condemned.

Supports India's demand for zero tolerance towards terrorism at multilateral forums.

##### Strategic Significance

Signals India's resolve that deterrence and counter-terror actions are defensive, not escalatory.

Sends a message to the international community amid evolving debates on coercion, impunity, and rule of law.

##### Challenges and Limitations

UNSC debates often remain declaratory, with limited enforceability.

Pakistan's presence as an elected member allows it continued access to global platforms.

Divergent interests of major powers often dilute collective action on state-sponsored terrorism.

#### Conclusion

India's statement at the UNSC underscores a clear and principled stance: terrorism cannot be normalised, excused, or selectively interpreted. By firmly rebutting Pakistan's narrative, India reaffirmed its commitment to international rule of law while asserting its right to safeguard national security. For UPSC, this episode illustrates the intersection of foreign policy, international law, counter-terrorism, and multilateral diplomacy, highlighting India's effort to shape global norms in an increasingly contested international order.

#### UPSC Mains Exam Practice Question

**Ques :** Discuss the challenges faced by the United Nations Security Council in addressing state-sponsored terrorism. How has India used multilateral forums to counter attempts at legitimising terrorism? **(150 Words)**



## Page 08 : GS III : Indian Economy / Prelims Exam

India's ambition to achieve 500 GW of non-fossil fuel capacity by 2030 hinges critically on building strong domestic manufacturing ecosystems for solar photovoltaics (PV) and advanced chemistry cell (ACC) batteries.

The Production Linked Incentive (PLI) scheme has been positioned as the main industrial policy instrument to achieve this objective, drawing confidence from its relative success in telecom manufacturing.

However, the experience with solar PV and battery cell manufacturing reveals structural limitations of relying primarily on capital incentives to build high-technology, upstream manufacturing capacity.

### Core Issues Highlighted in the Article

#### 1. Uneven Progress Across the Value Chain

In solar PV manufacturing, downstream activities such as module assembly have progressed relatively well (around 56% of targets achieved).

In contrast, upstream segments—polysilicon and wafers—have reached only 14% and 10% of targets respectively.

These upstream stages are capital-intensive, technology-heavy, and knowledge-driven, making them harder to scale quickly.

Implication:

India risks remaining dependent on imported raw materials despite domestic assembly, undermining true self-reliance.

#### 2. Battery Manufacturing Lag and EV Transition Risks

The PLI scheme for ACC battery manufacturing aimed to create 50 GWh capacity with an outlay of ₹18,000 crore.

By late 2025, only 1.4 GWh (2.8%) had been commissioned.

Challenges include:

Strict domestic value addition (DVA) norms (25% in 2 years, 60% in 5 years).

Complexities of gigafactory construction.

Limited access to experienced foreign technical experts, especially from China.

Implication:

Delays threaten India's electric vehicle (EV) transition and energy storage goals.

#### 3. Limits of Capital Support as an Industrial Strategy

### Manufacturing woes

Capital support alone will not add to battery cell manufacturing capacity

India's quest to install 500 GW non-fossil fuel capacity by 2030 has found its primary industrial engine in the Production Linked Incentive (PLI) schemes. Buoyed by the momentum the scheme generated in telecom manufacturing, where the government pays out a predetermined sum only if companies achieve agreed sales targets annually, ministries expect the initiative to transform India from a net importer of green technology into a global manufacturing hub. Unlike telecom, however, the PLI for high-efficiency solar photovoltaics and advanced chemistry cell battery storage face daunting implementation challenges. While downstream module assembly is robust (achieving 56% of its specific target by mid-2025), the critical upstream segments remain a bottleneck. Polysilicon and wafer manufacturing, the most technology-intensive parts of the value chain, have only reached 14% and 10% of their respective targets. This disparity highlights a persistent reliance on imported raw materials and specialised technical expertise, prompting the government to consider additional capital subsidies to de-risk these high-capex upstream projects.

Similar woes stalk the scheme for battery manufacturing. The progress towards establishing 50 GWh of domestic battery cell production to fuel the electric vehicle revolution, with an outlay of ₹18,000 crore, has been sluggish. By late 2025, only about 2.8% (1.4 GWh) of the targeted capacity had been commissioned. The gap between policy ambition and ground reality in battery manufacturing stems from stringent domestic value addition requirements – mandating 25% within two years and 60% within five – and the immense technical barriers of “gigafactory” construction. To add to these are challenges such as not issuing visas to Chinese technical experts, who will be setting up several manufacturing facilities. The Indian government's expectation that mere capital support will substantially improve high-technology manufacturing is misplaced. The complex infrastructure required to make it at scale requires decades of research investment and workforce training. While mega corporates expect international technology transfers to accelerate the process, they are capital intensive and do not always translate to near-term gain. Several companies face steep fines for not delivering on their deadlines. A relook at provisions in the PLI scheme to prioritise expertise and technical know-how rather than the net worth of companies bidding for PLI contracts is necessary.



The article argues that capital subsidies alone cannot compensate for:

Decades of accumulated R&D

Skilled manpower and tacit manufacturing knowledge

Mature supplier ecosystems

High-technology manufacturing depends on learning-by-doing, process optimisation, and cumulative expertise, which cannot be fast-tracked only through fiscal incentives.

#### **4. Technology Transfer: Not a Silver Bullet**

Indian corporates expect international technology transfers to bridge gaps.

However:

Such transfers are expensive and tightly controlled.

They may not lead to rapid indigenisation or cost competitiveness.

Several firms now face penalties for missing PLI milestones, reflecting a mismatch between policy design and industrial realities.

#### **Broader Policy and Governance Concerns**

##### **Design Bias in PLI:**

Greater emphasis on net worth and financial capacity rather than technical capability and experience.

##### **Industrial Ecosystem Gap:**

Weak domestic supplier base for equipment, chemicals, and precision components.

##### **Human Capital Constraint:**

Insufficient long-term investment in specialised workforce training and applied research.

#### **Way Forward (Reforms Suggested)**

##### **Recalibrate PLI Design**

Prioritise technical expertise, process know-how, and credible technology partnerships.

##### **Targeted Support for Upstream Segments**

Focus on polysilicon, wafers, cathode/anode materials, and cell chemistry.

**R&D and Skill Development**

Long-term public investment in materials science, electrochemistry, and manufacturing engineering.

**Flexible DVA Timelines**

Align localisation targets with technological learning curves.

**Strategic Global Integration**

Balance self-reliance with pragmatic access to global talent and supply chains.

**Conclusion**

The experience of solar PV and battery manufacturing under the PLI scheme highlights a crucial lesson for India's industrial policy: financial incentives cannot substitute for deep technological capability and human capital. While PLI has catalysed assembly-level manufacturing, upstream, high-technology segments demand a longer gestation period, sustained R&D, and ecosystem-based support. For India's energy transition and climate commitments to be credible, industrial policy must evolve from a capital-centric approach to a capability-centric one, integrating finance with knowledge, skills, and institutional depth.

**UPSC Prelims Exam Practice Question**

**Ques:** The Production Linked Incentive (PLI) scheme differs from traditional subsidies because it:

- (a) Provides upfront capital grants to firms
- (b) Links incentives to production and sales performance
- (c) Focuses only on MSMEs
- (d) Is restricted to renewable energy sector

**Ans: (b)**

**UPSC Mians Exam Practice Question**

**Ques:** Examine the limitations of the Production Linked Incentive (PLI) scheme as an instrument for developing high-technology manufacturing in India. **(150 Words)**

## Page 08 : GS III : Indian Economy / Prelims Exam

India's four Labour Codes, implemented in November 2025, mark the most comprehensive labour law reform since Independence. By subsuming 29 central labour laws into four Codes—on wages, industrial relations, social security, and occupational safety—the reform seeks to simplify compliance, promote formalisation, and balance worker protection with labour market flexibility. Given that India is a young country with a median age below 30, the impact of these Codes on youth employment is especially critical in shaping the future of work.

### *Future of work: India's youth under the new Codes*

The four Labour Codes aim to promote formalisation of employment and improve ease of doing business; gap in coverage of benefits is a major challenge

#### DATA POINT

Devika Vinod  
Meenakshi Shekhar

India's Labour Codes came into force in November 2025, marking the most significant labour law reform since Independence. By consolidating 29 central laws into four Codes, the reform aims to simplify compliance, universalise minimum wages, expand social protection, and modernise workplace regulation. Policy debates often portray the Codes as a balancing act between labour flexibility and worker protection. Prior to the consolidation, India's labour regime was fragmented across multiple Central and State laws governing wages, industrial relations, social security, and working conditions. With labour on the Concurrent List, this resulted in uneven enforcement and wide inter-State variation. Crucially, most protections applied only to the formal sector, leaving informal, contract, and casual workers, who form the bulk of the workforce, outside the scope of regulation. Against this backdrop, the government introduced four Labour Codes between 2019 and 2020. In 2024, India's median age was under 30, compared to around 40 in China and 50 in Japan. With nearly half the population still young, understanding how these changes affect youth employment is critical.

Despite its demographic advantage, India faces a pronounced youth employment crisis. According to the Periodic Labour Force Survey (PLFS) 2023-24, labour force participation among those aged 15-29 stood at 46.5%, far below the 76.4% observed among those aged 30-59. Youth unemployment is 10.2%, compared to less than 1% for older adults.

Gender disparities further widen these gaps. Only 28.8% of young women participate in the la-

bour force, compared to 63.5% of young men. In urban areas, unemployment among young women reached 20.1%.

Across all PLFS rounds, young workers are more likely than adults to be unpaid family workers within self-employment. They are disproportionately concentrated in informal employment. In 2023-24, nearly 90% of young workers were informally employed. Even within regular salaried jobs, 60.5% of young regular workers lacked social security, compared to 50.5% among workers above 30.

Contractual insecurity is also higher among youth. In 2023-24, 66.1% of young regular workers had no written contract, versus 53.6% for older ones. Only 16.5% of young workers had long-term contracts exceeding three years, compared to 35.4% among adults.

Young workers are also overrepresented in platform-based gig work. A NITI Aayog estimate suggests that 77 lakh workers were engaged in the gig economy in 2020-21, a figure projected to rise to 2.35 crore by 2029-30.

Against this backdrop, the new Labour Codes aim to promote formalisation while improving the ease of doing business. The introduction of a statutory national floor wage could raise earnings for young workers clustered in low-paid, entry-level jobs. If firms increasingly rely on fixed-term contracts, the Codes mandate parity in wages and benefits with permanent workers.

The requirement of appointment letters for all workers and guaranteed wage payments, even during leave, strengthens baseline employment security. The Code on Social Security extends welfare schemes covering health, maternity, disability, education, and skill development to unorganised workers. Gig and platform workers are explicitly recognised in national law, with provisions for registration from age 16 and the creation of National and State Social Security Boards. Unlike the earlier Unor-

ganised Workers' Social Security Act (2008), which had limited impact, the new Code offers clearer institutional mechanisms.

Labour market transparency is also enhanced through mandatory vacancy reporting to career centres. The Industrial Relations Code further affects youth employment by reducing hiring frictions through a higher retrenchment threshold. It provides legal clarity for contract labour and fixed-term employment categories dominated by young workers while extending benefits such as leave, health cover, social security, and gratuity to fixed-term employees after just one year of service.

However, several challenges remain. Many provisions for unorganised and gig workers mirror those under the 2008 Act, including a size-based definition of enterprises with fewer than 10 workers. PLFS 2023-24 shows that 42.7% of young workers lack written contracts, and nearly one-fifth of them work in enterprises with more than 10 workers, leaving significant gaps in coverage. Discretionary language in provisions for gig workers and weak statistical definitions of digital platform employment complicate coverage, especially given widespread multiple job-holding. Despite the Second National Commission on Labour having urged the government as early as 2002 to modernise labour protections in response to technological change and evolving work arrangements, two decades later, policy follow-through and statistical innovation have been slow.

These gaps point to an urgent need for stronger labour data systems and proactive worker registration. Identifying gig and platform workers in national surveys, instead of subsuming them under broad self-employment categories, would strengthen policy design and protection.

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#### Labour shift

Statistics used in this article are from Periodic Labour Force Survey (PLFS)



Chart 1: Composition of employment among 15-29 year olds and 30-59 year olds across PLFS rounds between 2017 and 2024

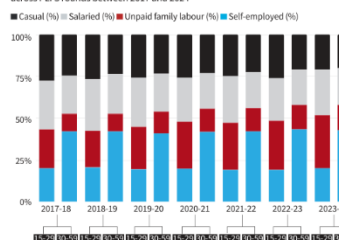
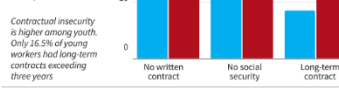


Chart 2: Types of informality of jobs among regular salaried workers in 15-29 and 30-59 age groups



Contractual insecurity is higher among youth. Only 16.5% of young workers had long-term contracts exceeding three years

#### Background: Youth Employment Context

Despite its demographic advantage, India faces a serious youth employment challenge:

As per Periodic Labour Force Survey (PLFS) 2023-24:

Labour force participation (15-29 years): 46.5%, versus 76.4% for ages 30-59

Youth unemployment: 10.2%, compared to <1% for older adults

## Gender gap is stark:

Young women's participation: 28.8%

Urban young women unemployment: 20.1%

## Informality dominates youth employment:

Nearly 90% of young workers are informally employed

Over 60% of young regular workers lack social security

66.1% of young regular workers have no written contract

Additionally, youth are increasingly concentrated in gig and platform work, with NITI Aayog estimating gig workers to rise from 77 lakh (2020–21) to 2.35 crore by 2029–30.

## How the Labour Codes Affect Youth Employment

### 1. Formalisation and Wage Security

Introduction of a statutory national floor wage can improve earnings for young workers clustered in low-paid, entry-level jobs.

Mandatory appointment letters and guaranteed wage payments (including during leave) strengthen baseline job security.

### 2. Fixed-Term Employment and Flexibility

The Industrial Relations Code legitimises fixed-term employment, common among youth.

It mandates parity in wages and benefits between fixed-term and permanent workers.

Fixed-term employees become eligible for gratuity after one year, improving social protection.

### 3. Expansion of Social Security

The Code on Social Security extends coverage to unorganised, gig, and platform workers, including health, maternity, disability, education, and skill development benefits.

Gig and platform workers are explicitly recognised for the first time in national labour law, with provisions for registration (from age 16) and the creation of National and State Social Security Boards.

### 4. Labour Market Transparency

Mandatory vacancy reporting to career centres improves job-market information flows, which can particularly benefit first-time job seekers.

## Key Challenges and Gaps



### **Incomplete Coverage of Informal Youth**

Many provisions mirror the older Unorganised Workers' Social Security Act, 2008, which had limited impact.

Enterprise-size thresholds (less than 10 workers) exclude a significant share of young workers, even in larger establishments.

### **Gig and Platform Work Ambiguities**

Provisions for gig workers rely on discretionary language.

Weak statistical identification of platform work—often subsumed under self-employment—limits effective targeting.

### **Contractual Insecurity Persists**

A large proportion of young workers still lack written or long-term contracts, reducing the real-world impact of legal reforms.

### **Data and Implementation Deficit**

Despite recommendations from the Second National Commission on Labour (2002), labour statistics and registration systems have not kept pace with technological and workplace changes.

### **Way Forward**

Strengthen labour data systems to explicitly identify gig and platform workers in surveys.

Proactive worker registration using digital platforms to ensure benefit delivery.

Reduce discretion in social security provisions for gig workers through clearer rules.

Gender-sensitive implementation, especially in urban labour markets.

Align labour reforms with skill development and education policy to improve youth employability.

### **Conclusion**

The new Labour Codes represent a structural shift in India's labour governance, with the potential to reshape youth employment by encouraging formalisation, improving wage security, and extending social protection to emerging forms of work. However, persistent informality, contractual insecurity, and data gaps limit their transformative impact. For India to fully leverage its demographic dividend, labour reforms must be complemented by robust implementation, better labour statistics, and targeted protection for young and gig workers. Only then can the future of work for India's youth become more secure, inclusive, and productive.

### UPSC Prelims Exam Practice Question

**Ques:** The introduction of a statutory national floor wage under the Code on Wages is primarily intended to:

- (a) Replace minimum wages fixed by State governments
- (b) Ensure uniform wages across all sectors and States
- (c) Provide a baseline for minimum wage fixation, especially for low-paid workers
- (d) Eliminate informal employment

**Ans:** c)

### UPSC Mains Exam Practice Question

**Ques:** Discuss how the Code on Social Security attempts to address the challenges faced by gig and platform workers. What gaps remain in ensuring meaningful protection for India's youth workforce? **(150 Words)**



**Page 11 : GS II : International Relations**

The conclusion of the India-European Union Free Trade Agreement (FTA), alongside the Comprehensive Strategic Agenda for 2030, marks a qualitative shift in India-EU relations from trade facilitation to co-development of frontier technologies.

Unlike earlier technology partnerships focused on supply-chain resilience, the new framework operationalises joint R&D in semiconductors and artificial intelligence (AI). By linking India's design talent and data assets with Europe's research infrastructure and regulatory capacity, the FTA aims to strengthen strategic autonomy in critical technologies amid intensifying global techno-geopolitical competition.

## The impact of India-EU FTA for AI and semiconductor tech

The India-EU Free Trade Agreement moves beyond supply chains to operationalise joint R&D in advanced semiconductor integration. It also formally links the European AI Office with India's National AI Mission

Yasudevan Mukunth

In a milestone, India and the European Union (EU) have hailed the conclusion of the India-EU Free Trade Agreement (FTA) while launching a 'Comprehensive Strategic Agenda' for 2030. Among other measures, the pact moves beyond supply chains to operationalise joint R&D in advanced semiconductor 'heterogeneous integration' and chip design. It also formally links the European AI Office with India's National AI Mission to jointly develop safe, human-centric AI and take advantage of what the agreement called India's vast 'multilingual datasets' and Europe's research infrastructure to secure strategic autonomy in critical technologies.

**The three diplomatic phases**  
The AI and semiconductor aspects represent the maturation of three diplomatic phases. The first phase began with the India-EU Strategic Partnership: A Roadmap to 2030. At this stage, discussions on 'technology' were largely confined to general matters of cybersecurity, 5G networks, and data protection and there was no specific mechanism for a more concrete collaboration between the bloc and India on hardware such as semiconductors, or specific AI model development.

In the second phase, around 2022, Prime Minister Narendra Modi and EU President Ursula von der Leyen launched the India EU Trade and Technology Council. This body in turn created the Working Group 1 on Strategic Technologies, which moved the relationship from diplomacy to involving technical experts. In fact the new deal has credited this group with managing its 'technology and innovation' aspect.

In the third and final phase, in 2023, India and EU signed the Semiconductor Memorandum of Understanding (MoU). This MoU was primarily defensive in the sense that it focused on improving the resilience of supply chains and on providing early warnings of shortages. Between 2022 and the present deal, the MoU evolved into a more 'offensive' partnership, so to speak, with a focus on creating new technologies, including through designing and prototyping, in addition to monitoring existing supply chains.

**On 'heterogeneous integration'**  
Perhaps the most significant technical detail in the document is 'heterogeneous integration' because it recognises that India is years away from building cutting-edge logic fabrication facilities, for example, those that manufacture chips with nodes of 2.5 nm, and thus pivots to 'advanced packaging'. Heterogeneous integration involves stacking different types of chips, such as logic, memory, and sensors, into a single package. Such combinations are critical for AI.

Contemporary AI accelerators like Nvidia's Graphics Processing Units (GPUs) bank more on how memory is packaged next to the processor instead of only the raw transistor size. By targeting this, the EU and India are trying to capture the value-added segment of the supply chain that is also less capital-intensive than a



**Hub boost:** Semiconductors being inspected at the Tescov Semiconductor Private Limited, at Electronic City Phase II, in Bengaluru on September 19, 2023. (HINDU/KUMAR R)

fabrication facility but which is just as critical for performance.

The agenda also explicitly connects semiconductor manufacturing to AI utility as the text says the deal will focus 'on design and prototyping for AI applications', thus creating a vertical market. While in 2023 the focus was on 'making chips for cars', following a crisis in their availability, the new goal is to make chips that AI models require.

India possesses roughly 20% of the world's chip design talent (on the flip side most of them work for U.S.-based firms like Intel and Qualcomm). The EU has the research infrastructure, such as IME in Belgium and Fraunhofer Gesellschaft in Germany, but lacks the design scale. And the deal effectively creates a mechanism to unify India's designer capital with the EU's physical capital, to create indigenous AI hardware and reduce their reliance on US intellectual property.

Finally, the operational vehicles for the deal's semiconductor strategy are the so-called Blue Valleys – a regulatory

regulator, can interact directly with the India AI Safety Institute, India's technical auditor. As a result, the technical staff at these agencies could have a formal mandate to coordinate without requiring political permissions for every interaction.

Further, perhaps the most concrete part of the AI section of the deal is the point about 'testing and evaluation'. Currently, the world doesn't have a common definition of what constitutes safe AI. The EU's priority might be gender bias while India's might be political neutrality – which means a developer will have to make their model pass two tests ahead of clearance. But now, by collaborating on testing, the two agencies will likely co-author and rationalise the checklists for the models. So if the European AI Office develops a specific mathematical test to measure the rate or scope of hallucinations in a large language model, it can share that test with the India AI Safety Institute for India to adopt. In fact, the point of linking these agencies is to eventually reach a point where one accepts a safety certificate issued by the other. Going ahead this will require the agencies to align their audit procedures and staff training.

For Indians this could be a civil liberties backdoor of sorts. That is, because European audit manuals are strongly rooted in the EU's Charter of Fundamental Rights, Indian users might unknowingly gain digital protections that the domestic political climate currently sidelines. EU safety benchmarks aggressively penalise algorithmic bias against minorities and restrict invasive biometric surveillance. If Indian developers must clear these hurdles to ensure their models can be exported to Europe, the AI products deployed domestically will be embedded with European regulatory attitudes. Thus Indian users could interact with AI agents that are technically constrained from reinforcing majoritarian narratives or profiling of vulnerable communities.

However, there is also the possibility of this opportunity devolving into a stratified ecosystem akin to India's pharmaceutical sector, where some manufacturers rigorously adhere to safety protocols for exports to U.S. and European markets while cutting corners for domestic supply. That is, Indian firms might engineer 'cloak' and more bias-free algorithms specifically for the EU market to secure lucrative contracts while deploying invasive or unrestricted versions at home, where enforcement remains lax.

### Financial instruments

In order to fuel all these ambitions, the agenda musters two financial instruments. First, the text requires both sides 'explore options for association of India to Horizon Europe'. If this happens, it would elevate India to the highest tier of partnership available to non-EU nations and allow Indian entities to lead consortia and compete directly for grants from the EU's €5.5-billion research budget (₹14 lakh crore). This could be a bonus for the semiconductor sector as it will allow Indian chip startups to bypass the often risk-averse domestic capital markets.

Second, and on a related note, the deal also places the European Innovation Council at the helm of a new startup partnership. The Council specialises in what it calls 'patient capital' for high-risk technologies such as quantum computing and novel chip architectures that traditional venture capitalists often avoid. By linking the Council with the Start-up India platform, the agreement creates a dedicated cross-border funding corridor for 'hard' technologies and fills a gap left by private investors, and could help ensure the deal's design ambitions are backed by the necessary funds.

## Evolution of India-EU Tech Cooperation

### Phase I: Strategic Dialogue (up to 2021)

## Daily News Analysis

Under the India–EU Strategic Partnership Roadmap 2025, cooperation remained limited to broad areas like cybersecurity, 5G, and data protection.

There was no concrete mechanism for hardware collaboration or AI model development.

### Phase II: Institutionalisation (from 2022)

Launch of the India–EU Trade and Technology Council (TTC) by Narendra Modi and Ursula von der Leyen.

Creation of Working Group on Strategic Technologies shifted engagement from diplomacy to expert-driven technical cooperation.

### Phase III: From Supply Chains to Co-Innovation (2023 onwards)

The Semiconductor MoU (2023) initially focused on supply-chain resilience and early-warning systems.

The FTA transforms this into an offensive innovation partnership, emphasising design, prototyping, and next-generation applications.

### Semiconductor Dimension: Focus on Heterogeneous Integration

#### 1. Strategic Rationale

India is years away from establishing cutting-edge logic fabrication (2–3 nm nodes).

The FTA therefore pivots to advanced packaging and heterogeneous integration, where multiple chips (logic, memory, sensors) are combined into a single package.

#### 2. Importance for AI

Modern AI accelerators depend more on memory proximity and packaging efficiency than transistor miniaturisation alone.

This allows India and the EU to target high value-added, less capital-intensive segments of the semiconductor value chain.

#### 3. Complementarity of Strengths

India holds ~20% of global chip design talent (largely employed by US firms).

The EU possesses world-class research infrastructure such as IMEC (Belgium) and Fraunhofer-Gesellschaft (Germany).

The agreement seeks to integrate India's human capital with Europe's physical and institutional capital, reducing dependence on US intellectual property.

#### 4. Blue Valleys Concept

Creation of regulatory enclaves ("Blue Valleys") aligning Indian manufacturing with EU technical standards.



## Daily News Analysis

This effectively extends EU Single Market standards to Indian soil, enabling seamless integration into European supply chains without repeated certification.

### **AI Dimension: Towards a Common Market for AI**

#### **1. Regulatory and Institutional Linkages**

Formal linkage between the European AI Office and India's National AI Mission / IndiaAI Safety Institute.

Enables direct regulator-to-regulator engagement, bypassing slow diplomatic channels.

#### **2. Convergence on AI Safety and Testing**

Joint work on testing, evaluation, and safety benchmarks for AI models.

Over time, this could lead to mutual recognition of AI safety certifications, reducing compliance costs for developers.

#### **3. Brussels Effect in Action**

EU's regulatory norms—rooted in the Charter of Fundamental Rights—may indirectly shape Indian AI systems.

Potential benefits for Indian users include stronger safeguards against algorithmic bias and intrusive surveillance.

#### **4. Risks and Limitations**

Possibility of regulatory dualism, where firms deploy high-standard AI for EU markets while offering weaker protections domestically.

Highlights the need for stronger domestic enforcement and AI governance capacity in India.

### **Financial and Innovation Support Mechanisms**

#### **1. Horizon Europe Association**

Exploring India's association with Horizon Europe, the EU's €95.5 billion research framework.

Would allow Indian entities to lead consortia and directly access EU grants, benefiting high-risk semiconductor and AI R&D.

#### **2. Startup and Patient Capital**

Partnership with the European Innovation Council to provide patient capital for deep-tech sectors such as quantum computing and advanced chip architectures.

Linked with Start-up India, creating a cross-border funding corridor for hard technologies often neglected by private venture capital.

### **Strategic Significance**

## Daily News Analysis

Economic: Moves India up the value chain from assembly to design, integration, and innovation.

Technological: Builds indigenous AI hardware and governance capacity.

Geopolitical: Reduces reliance on US-centric technology ecosystems; strengthens multipolar tech order.

Regulatory: Positions India within a global rule-making ecosystem for AI and emerging technologies.

### Conclusion

The India–EU FTA represents a paradigm shift from trade liberalisation to techno-strategic partnership. By jointly targeting advanced semiconductor integration and AI governance, the agreement leverages complementarities between India's talent and Europe's research and regulatory strengths. However, realising these gains will depend on effective implementation, domestic regulatory capacity, and ensuring that high standards apply not only to exports but also to technologies deployed within India.

### UPSC Prelims Exam Practice Question

**Ques: The term "heterogeneous integration", recently seen in news, is best associated with:**

- (a) Integration of AI algorithms with big data platforms
- (b) Stacking different types of semiconductor chips in a single package
- (c) Manufacturing chips using multiple lithography nodes simultaneously
- (d) Combining public and private capital for semiconductor fabs

**Ans : b)**

### UPSC Mains Exam Practice Question

**Ques :** The India–EU FTA seeks to reduce strategic dependence in critical technologies. Examine the opportunities and limitations of this approach in the context of AI hardware and semiconductor ecosystems. **(150 Words)**

Quality education

## Page : 08 : Editorial Analysis

### *A spark to drive India's e-LCV transition*

**W**henver your online orders are delivered, there is a good chance that they travelled in a light commercial vehicle (LCV) – those small (sub-3.5 tonne) trucks that are the backbone of India's booming e-commerce economy. Here is a fact: while India has spent years regulating passenger car energy consumption, LCVs have operated in a regulatory blind spot. India has made significant strides in regulating fuel efficiency for passenger cars through corporate average fuel efficiency (CAFE) norms for fleet-wide CO2 emission targets. However, LCVs operate without such mandates, despite their high utilisation and substantial market presence.

Policymakers are finally addressing this regulatory gap: in late July, 2025, the Bureau of Energy Efficiency (BEE) unveiled a fuel consumption standard proposal for LCVs, which will run from 2027 through 2032.

Ahead of the release of the draft, automakers lobbied for full exemption of LCVs from CAFE regulations, citing the price sensitivity of the market and claiming that the standard would necessitate expensive technologies in internal combustion engines (ICE). Eventually, the request was set aside, signalling the government's commitment to decarbonisation.

LCVs in India accounted for 48% of commercial goods vehicles in 2024, yet electrification remained low at 2%. Bringing this sector under regulatory oversight is pivotal for India's clean transport agenda.

#### Where things stand

India's LCV fleet averaged 147.5 g CO2/km in 2024. Without the minimal 2% share of battery electric LCVs (e-LCVs), this figure would be 150 g CO2/km, which shows how even marginal electrification impacts emissions.

Automakers have entered the Battery Electric Vehicle (BEV) market with few models, offering sub-35 kWh battery packs with maximum ranges of 150 km. Why so cautious? Market realities are



**Moorthy Nair**

Researcher at the International Council on Clean Transportation

The proposed fuel efficiency norms for light commercial vehicles could become a turning point – with smart policy design, stringent standards, and strategic use of incentives

tough: high upfront costs and limited model availability constrain demand. Although battery LCVs offer lower total ownership costs than conventional LCVs, inconsistent purchase incentive policies among jurisdictions are not helping.

For example, the PM E-DRIVE incentive scheme excludes LCVs, though some State policies, such as those in Maharashtra and Madhya Pradesh, provide support to overcome the initial acquisition barrier.

#### Fuel efficiency standards

The potential of fuel efficiency standards to drive electrification is often misunderstood. While these regulations won't guarantee widespread electrification, stringency does. When standards are lax, manufacturers find it cheaper to optimise existing ICE vehicles through modest upgrades than invest in electric vehicles. Here is proof of what happens when standards are too relaxed: BEVs make up just 3% of the passenger car fleet even after 8 years of CAFE norms.

Here is where the math gets interesting. ICCT research shows 116.5 g CO2/km is the crucial threshold at which introducing e-LCVs becomes more cost-effective for compliance than ICE-only advancements. Put simply, beyond this point, CO2 reductions cost manufacturers less if achieved through electrification than ICE upgrades. The Bureau of Energy Efficiency's proposed 115 g CO2/km standard just surpasses this benchmark, meaning entry of e-LCVs into the market is feasible but not strong enough to drive significant electrification.

There is a chicken-and-egg problem here: most conventional LCVs cost below ₹1 million, while BEV equivalents typically exceed this, making manufacturers reluctant to transition. Electrification momentum spurs innovation, scales production, and, together with falling battery prices, reduces BEV upfront cost.

To catalyse BEV penetration, regions such as China, the European Union, and the United States

use a super credit multiplier, which counts each BEV multiple times when calculating compliance. Think of it as regulatory accounting that makes going electric look more attractive on paper: super credits make electrification a more cost-effective pathway to compliance.

The draft proposal introduces super credits for e-LCVs and assigns them a CO2 value of zero for compliance, further reinforcing BEV support (unlike the passenger car standards, which include upstream emissions).

However, the proposal also extends these credits to intermediate technologies like hybrid BEVs and applies CO2 offset factors to select ICE technologies. This approach risks fragmenting the market, essentially postponing BEV adoption. If manufacturers can comply by tweaking conventional vehicles or adding hybrids, why invest in electrification? Credits and offset factors – designed as an interim measure to be phased out as the market matures – can ease early compliance by artificially amplifying the emission reductions but dilute the regulation's effectiveness.

The Bureau of Energy Efficiency's proposal considers phasing out super credits for e-LCVs but continuing incentives for hybrids and select ICE technologies. This could prolong the dominance of ICEs.

#### The way forward

So, what is the bottom line? India has got the pieces; now it needs to put them together. The key to electrification lies in smart policy design. A stringent standard that makes electrification economically compelling, and a strategic use of incentives, can drive genuine transformation. These elements, together with a timely rollout of regulations, will determine whether LCVs drive the transition to clean transport.

The alternative is to repeat the challenges seen in the passenger car segment, where relaxed standards and ongoing incentives have kept electrification at just 3%.

## GS Paper III : Environment

**UPSC Mains Practice Question:** Critically analyse the role of "super credits" in accelerating electric vehicle adoption. Should India rely on such regulatory accounting tools for e-LCVs, or do they risk delaying full electrification? **(250 Words)**

## Context :

Light Commercial Vehicles (LCVs) — sub-3.5 tonne trucks that power India's logistics and e-commerce ecosystem - have long remained outside the ambit of India's vehicle fuel-efficiency regulations.

While passenger cars have been regulated under CAFE norms, LCVs operated in a policy blind spot despite their high utilisation, urban concentration, and growing emissions footprint.

The fuel consumption standards for LCVs proposed in July 2025 mark a crucial policy shift, with significant implications for decarbonisation, electric mobility, and industrial strategy.

## Why LCVs Matter in India's Clean Transport Agenda

LCVs accounted for 48% of commercial goods vehicles in 2024, yet electrification stood at just 2%.

Their role in last-mile delivery means they operate intensively in cities, amplifying local air pollution and CO<sub>2</sub> emissions.

Even marginal electrification shows impact: without the small share of e-LCVs, fleet emissions would rise from 147.5 to 150 g CO<sub>2</sub>/km.

**Policy relevance:** Targeting LCVs offers high emissions reduction per vehicle, making them low-hanging fruit for climate and urban air-quality goals.

## The Regulatory Shift: Fuel Efficiency Standards (2027–2032)

The proposal by Bureau of Energy Efficiency introduces fleet-average CO<sub>2</sub> standards for LCVs for the first time.

Automaker lobbying for exemption — citing cost sensitivity and ICE technology constraints — was rejected, signalling stronger commitment to decarbonisation.

## Significance:

This closes a major regulatory gap and aligns India's transport policy with global best practices.

## Electrification Economics: Why Stringency Matters

Research by the International Council on Clean Transportation (ICCT) highlights a critical threshold:

At 116.5 g CO<sub>2</sub>/km, electrification becomes more cost-effective for compliance than further ICE optimisation.

The proposed standard of 115 g CO<sub>2</sub>/km marginally crosses this threshold.

## Implication:

The standard makes e-LCVs viable, but not inevitable.



Manufacturers may still prefer incremental ICE improvements unless standards tighten further.

## Super Credits: Catalyst or Constraint?

### What are super credits?

Regulatory multipliers that count each electric vehicle as more than one vehicle for compliance purposes.

### Global practice:

Used in China, the EU, and the US to overcome the early-stage cost barrier of EVs.

### India's proposal:

Assigns zero CO<sub>2</sub> to e-LCVs and introduces super credits.

However, it also:

- Extends credits to hybrids and select ICE technologies

- Allows CO<sub>2</sub> offset factors for conventional vehicles

### Risk:

This may delay full electrification, as firms can comply by tweaking ICEs or deploying hybrids instead of investing in BEVs.

Experience from passenger cars shows that lax standards + prolonged incentives result in low EV penetration (only ~3% even after 8 years of CAFE).

## Structural Challenges to e-LCV Adoption

### High upfront costs

Conventional LCVs: < ₹10 lakh

e-LCVs: significantly higher, despite lower total cost of ownership

### Policy inconsistency

Central schemes like PM E-DRIVE exclude LCVs

Support depends on uneven State policies (e.g., Maharashtra, Madhya Pradesh)

### Chicken-and-egg problem

Low demand → limited models → high costs

High costs → weak demand → slow innovation

## Way Forward

### **Increase stringency gradually but predictably**

Clear glide path beyond 2032 to push manufacturers decisively towards BEVs

### **Time-bound super credits**

Strong incentives for e-LCVs initially, with planned phase-out for hybrids and ICE offsets

### **Align fiscal incentives with regulations**

Include LCVs in national EV incentive schemes to complement standards

### **Focus on urban freight electrification**

Integrate e-LCVs into city-level clean air and climate action plans

### **Learn from passenger car experience**

Avoid repeating the mistake of relaxed norms that lock in ICE dominance

## Conclusion

India's proposed fuel-efficiency standards for LCVs are a necessary and overdue reform, capable of reshaping the freight electrification landscape. However, regulatory ambition, not mere inclusion, will determine outcomes. A sufficiently stringent standard, combined with targeted and time-bound incentives, can trigger scale, innovation, and cost reduction in e-LCVs. Otherwise, India risks replicating the passenger-car trajectory — incremental efficiency gains, prolonged ICE reliance, and missed climate opportunities. For India's clean transport transition, LCVs can either be the spark or another stalled promise.

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