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INDIA'S GROUND-LEVEL ENERGY DEMAND:

Alternative Adoption and the Outlook for Global Suppliers

CEEW
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KEY POINTS

- Various energy sectors are evolving very differently: grid-scale battery storage and three-wheeler electrification have grown faster over the period than most assessments in 2023 anticipated; electric cooking adoption and heavy-freight fuel switching have changed little; crude and LPG import dependence have risen, and operating gas-fired capacity has declined.

- India has now reached 50 per cent of installed electricity capacity from non-fossil sources, but demand for hydrocarbon remains high in sectors like heavy freight and industrial heat.

- Demand is increasingly driven by cooling, and with nighttime temperatures in India rising faster than daytime temperatures, the corresponding peak happens at night, during which solar output is unavailable. This opens a gap between installed capacity (dominated by renewable) and the electricity delivered (dominated by fossil fuels).

- Coal remains important as a balancing resource, mostly to provide availability at peak, filling in for other storage options rather than to operate at high utilisation. Gas is barely used even as backup during peak demand periods (heatwaves); it is too expensive to serve as anything else than an emergency reserve.

- Battery storage has grown rapidly but remains short of assessed system requirements. However, figures fail to capture smaller utilities such as residential batteries paired with rooftop solar, but at this point they can hardly be made available to the grid to tap into for balancing needs.

- Transport electrification is most advanced in the segments accounting for the smallest share of fuel demand (two- and three-wheelers), and least advanced in the segment accounting for the largest (cars and trucks).

- For heavy freight, LNG is considered for substitution to oil but deployment is still in its infancy.

- Given the heterogeneity of the steel industry, switching from coal-based direct reduced iron production to gas-based DRI (the most credible option available even if not a long-term decarbonisation option) is concentrated among large producers with direct EU exposure and sufficient balance sheet capacity.

- As of February 2026, approximately 8,000 tonnes per year of green hydrogen capacity had been commissioned, still far from the target of 5 million tonnes per year by 2030. Prices suggest some displacement, in particular for ammonia production, is feasible.

- The expansion of access to LPG has established a household energy system dependent on a largely imported fuel arriving predominantly through one maritime corridor (the Strait of Hormuz).

ABOUT THIS BRIEF

This brief sets out observed trends in India's energy system over the last 24 months. It is not a scenario exercise; modelled projections are identified as such and placed in a separate box. The emphasis on observed data reflects the availability of evidence: the supply disruptions between February and July 2026 tested a number of assumptions about Indian demand, and the outcomes are documented in government statements, dispatch data and vehicle registrations.

The central observation is that India's constraint in 2026 was the routing of hydrocarbon imports rather than demand for them, and that the capacity to substitute varied widely across sectors. Substitution is well established in some household and light-mobility segments and largely absent in heavy freight and industrial heat. Assessments of the durability of Indian demand for imported oil and gas therefore depend on which segment a given volume serves.

> Substitution is well established in some household and light-mobility segments and largely absent in heavy freight and industrial heat.

For readers assessing capital commitments, two questions follow: the delivered price at which Indian gas demand becomes commercially viable in each segment, and the supplier attributes Indian buyers have come to prioritise since 2024. Section 4 addresses both.

Observed rates of change, 2024–2026

Indicator	Earlier reference point	Latest observation
Non-fossil share of installed capacity	~36% (2023, CEA renewables basis); 45.5% (July 2024)	51.5% of 509 GW (Nov 2025)
Total installed capacity	395 GW (February 2022)	524 GW (February 2026)
Non-fossil capacity, absolute	179 GW renewables (May 2023)	266.78 GW non-fossil (end-2025)
Grid-connected rooftop solar	27.9 GW (early 2026)	30.1 GW (May 2026)
Peak demand met	203 GW (FY22)	270.8 GW (May 2026)
Operational battery storage (grid-scale)	0.78 GWh (December 2025)	8.5–8.7 GWh (June 2026)
Gas-fired share of generation	—	~1.5%; 8 GW generated nothing in FY25
Electric two-wheeler penetration	~4% (FY22)	6.54% (FY26); 10.6% (June 2026)
Electric three-wheeler, L5 passenger	—	50.1% (June 2026)
Electric four-wheeler penetration	<1% (2022)	Indicator
Crude oil import dependence	85.5% (FY22)	88.7% (FY26)
Crude oil imports, volume	224 (FY23)	245 Mt (FY26)
LNG imports, volume	35,720 MMSCM (FY25)	34,427 MMSCM (FY26)
LPG effective import exposure	—	~95% (derived; see Section 3)
LNG trucks in service	Negligible before 2024	~700 nationally
Green hydrogen capacity commissioned	Nil at mission launch (January 2023)	~8,000 tonnes/year (February 2026)
Electric cooking adoption	~5% of households (IRES 2020)	~5% of households

The indicators above move at markedly different rates. Grid-scale battery storage and three-wheeler electrification have grown faster over the period than most assessments in 2023 anticipated. Electric cooking adoption and heavy-freight fuel switching have changed little. Crude and liquefied petroleum gas (LPG) import dependence have risen, and operating gas-fired capacity has declined. The sections that follow treat these separately rather than as a single transition.

Section 1: Electricity — capacity additions and system integration

Non-fossil capacity additions

India reached 50 per cent of installed electricity capacity from non-fossil sources in June 2025, five years ahead of the target set in its Nationally Determined Contribution. In June 2025 total installed capacity stood at 484 GW, of which 242 GW, or 50.1 per cent, was non-fossil, counting renewables, large hydro and nuclear.[1] By November 2025 non-fossil capacity had reached 262 GW of a total 509 GW, or 51.5 per cent.[2] Total installed capacity passed 524 GW by the end of February 2026.[3]

> India reached 50 per cent of installed electricity capacity from non-fossil sources in June 2025, five years ahead of the target

The milestone was met ahead of schedule and reflects sustained additions in solar and wind capacity over the preceding five years.

Installed capacity and share of generation

Installed capacity and delivered energy have diverged, and the difference accounts for continued demand for fossil fuel. Renewables briefly supplied 51.5 per cent of national demand on 29 July 2025, at a load of 203 GW.[4] However, India's thermal fleet supplied nearly 70 per cent of India's electricity between April and June 2026.[5]

Part of the divergence is definitional rather than physical. Grid-connected rooftop solar reached 30.11 GW by the end of May 2026, of which 9.56 GW across 26.21 lakh (2.62 M) systems was installed under the PM Surya Ghar Muft Bijli Yojana as at March 2026, alongside a further 6.43 GW of off-grid solar.[63, 64] Where this capacity is net-metered and self-consumed, its output reduces metered demand at the distribution level rather than registering as generation in central dispatch statistics. Distribution utilities on high-penetration feeders in parts of Gujarat, Rajasthan and Delhi report midday voltage rise and reverse power flow.[65] At roughly 19 per cent of India's 162 GW of installed solar, this is not large enough to account for the divergence described above, but it does mean that reported demand growth understates underlying consumption growth by a margin that national statistics are not able to isolate.

The remainder of the divergence reflects the profile of demand rather than any shortfall in renewable capacity addition. India's electricity demand has grown at roughly 5 per cent a year since 2019, while solar photovoltaics accounted for two-thirds of capacity additions over the same period.[6] Demand is increasingly driven by cooling: room air conditioners already account for something close to a quarter of peak demand, on the order of 60 to 70 GW.[7] International Energy Agency analysis finds that each additional degree Celsius of outdoor temperature was associated with roughly 7 GW of additional peak demand in 2024, a figure that could rise toward 12 GW per degree by 2030 in the absence of further efficiency action.[8]

Nighttime temperatures in India are rising faster than daytime temperatures.[6] Cooling load consequently extends from around sunset until after midnight rather than peaking at midday, and coincides with the period in which solar output is unavailable.

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May 2026 illustrated this. Amid maxima of 40 to 48 degrees Celsius across northwest and central India, peak demand set records on four consecutive days from 17 to 21 May, reaching an all-time high of 271 GW.[9] Peak demand in 2019 was approximately 180 GW, implying an increase of about 90 GW over seven years.[6]

Utilisation of gas-based generation

The coincidence of an evening peak with substantial idle gas-fired capacity might suggest an opening for gas-fired generation. The utilisation data indicate otherwise.

Thirty-one gas-fired power plants with a combined capacity of 8 GW generated not a single unit of electricity in FY25. IEEFA values these stranded assets at approximately US$ 8.2 billion (CA$11.3 billion). In April 2025, 5.3 GW of non-operating gas units were retired outright.[10] Gas-fired plants contributes roughly 10 GW during high-demand periods against a maximum installed capacity of around 20 GW — some 4 per cent of installed capacity and approximately 1.5 per cent of actual generation.[11]

The dispatch of gas-fired plants during the May 2026 heatwave was administratively directed rather than determined by the merit order. In early April 2026 the Ministry of Power directed all gas-based generating stations to maintain operational readiness during heatwave demand periods, converting commercially idle peaking capacity into what amounted to a government-managed emergency reserve. Fuel costs at the time, on Japan-Korea Marker-linked pricing, were near US$18 per million British thermal units (which amounts to about 25 CA$/GJ) — a level at which private generators cannot operate in a market dominated by cheaper domestic coal.[11]

India therefore holds peaking capacity that is not economic to dispatch at prevailing fuel prices. The constraint is the delivered gas price rather than available capacity. Observatory Research Foundation analysis finds that at LNG stabilising around US$6 per mmBtu (about CA$8/GJ), gas-fired generation would become structurally more competitive than at any point in the past decade, with most of the upside lying in reactivating the existing stranded fleet rather than in new build.[12]

Battery storage: Deployment and assessed requirement

Battery storage has grown rapidly from a small base and remains well short of assessed system requirements.

Operational battery energy storage rose from 0.78 GWh in December 2025 to between 8.5 and 8.7 GWh by June 2026 — an eleven-fold increase in six months — with a further 2 to 3 GWh expected by the end of the year, taking installed capacity to somewhere between 12 and 15 GWh.[13] India added 4.6 GWh in the first quarter of 2026 alone.[14] Notably, 6.9 GWh of the operational fleet runs in merchant mode, indicating a shift toward market-based revenue rather than reliance on government-backed contracts.[13]

Assessed requirements are substantially larger. The Central Electricity Authority estimates that 411 GWh of storage will be needed by 2032, comprising 236 GWh of batteries and 175 GWh of pumped hydro.[15] Of 281 GWh of storage tendered since 2018, 105 GWh is under execution, 110 GWh remains stalled in the tendering phase, and 53 GWh of tenders have been cancelled outright. Domestic lithium-ion cell manufacturing capacity stands at roughly 2 GWh.[13]

> Battery storage has grown rapidly from a small base and remains well short of assessed system requirements.

> Behind-the-meter commercial, industrial and residential storage is not systematically captured in national reporting.

These figures cover grid-scale and utility-linked projects. Behind-the-meter commercial, industrial and residential storage is not systematically captured in national reporting, and the reported revision to the PM Surya Ghar scheme includes a dedicated subsidy component for residential batteries paired with rooftop solar.[65] Behind-the-meter capacity is therefore likely to be understated in the figures above, though on current evidence it is small relative to the grid-scale fleet. More importantly, the traditional behind the meter storage — the battery back-up that millions relied (and continue to rely) on to manage short outages, are not likely to be in a form that can be made available to the grid to tap into for balancing needs on account of the technology in use and the electronics controlling the storage systems.

Coal capacity under construction and planned

Coal continues to serve as the system's balancing resource, and additions are ongoing. As of early 2026, 39,545 MW of thermal capacity was under construction, including 4,845 MW of revived stressed projects; contracts had been awarded for a further 22,920 MW; and 24,020 MW of coal and lignite capacity had been identified at various planning stages. Around 97 GW of additional coal and lignite capacity is planned against an estimated thermal requirement of about 307 GW by 2034–35.[16]

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The government's own projection of plants load factor for coal plant in 2031–32 is approximately 61 per cent.[16] This implies that a significant share of the capacity is intended to provide availability at peak rather than to operate at high utilisation, substituting capital expenditure for storage capacity not yet in place.

Section 2: Transport — electrification by vehicle segment and the freight fuel mix

Segment shares of the vehicle fleet and of emissions

India's vehicle stock stood at approximately 226 million in 2023 on CEEW's estimates, and is projected to more than double to nearly 500 million by 2050, with two-wheelers accounting for around 70 per cent of the fleet by mid-century.[66] Two-wheelers already constitute roughly three-quarters of vehicles in operation, and two- and three-wheelers together around 80 per cent of the stock.[67]

Shares of energy use and emissions run close to the inverse. On IEA figures for 2021, two- and three-wheelers at about 80 per cent of the stock accounted for approximately 20 per cent of road transport energy demand and emissions, while trucks accounted for about 38 per cent of fuel consumption and emissions and cars about 25 per cent.[67] Medium and heavy-duty trucks are between 2 and 3 per cent of vehicles on the road and account for 40 to 45 per cent of road transport emissions, depending on the source and year.[68,25] Road transport accounts for around 90 per cent of India's transport emissions, and emitted approximately 370 Mt of CO_2 in 2023 on CEEW's estimates.[68,30]

This asymmetry frames the sections that follow: electrification is most advanced in the segments accounting for the smallest share of fuel demand, and least advanced in the segment accounting for the largest.

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Three-wheelers: Penetration by sub-segment

Three-wheelers are the segment in which electrification is most advanced. In June 2026, electric vehicles accounted for 50.1 per cent of passenger three-wheeler (L5) sales and 30.5 per cent of cargo three-wheelers.[17] The L5 category is served by established manufacturers, with Mahindra Last Mile Mobility, Bajaj Auto and TVS Motor holding a combined share of roughly 84 per cent.[18]

Three-wheelers are commercial assets whose operators are sensitive to running costs, which suggests that adoption in this segment reflects total cost of ownership rather than purchase incentives.

Aggregate sales and the composition of the total

India's total electric vehicle sales reached 2.45 million units in FY26, up 25 per cent year on year, with a record 280,093 units in March 2026 and overall penetration crossing 12 per cent for the first time in June 2026.[19,20]

These aggregate figures require one qualification. They include e-rickshaws and e-carts — a largely unorganised, low-specification segment that is a poor proxy for ecosystem maturity. On the basis of monthly registration splits, e-rickshaws and e-carts together account for very roughly 460,000 units annually, or approximately 19 per cent of the total.[21] Excluding them puts FY2025–26 nearer 2.0 million units, and reduces the headline penetration figure accordingly.

On this basis, electrification is concentrated in segments served by homologated, manufacturer-backed products competing on operating cost, and penetration in the leading such segment exceeds 50 per cent.

Two-wheelers: Penetration against projected trajectories

Electric two-wheeler penetration rose from 6.09 per cent in FY25 to 6.54 per cent in FY26, on total two-wheeler sales of 21.41 million.[19] The recently monthly figure is running well ahead of that annual average — 10.6 per cent in June 2026, against 7.3 per cent a year earlier.[17] 1.40 million electric two-wheelers were sold in FY26, 22 per cent growth on a large base.[22]

These figures can be compared with earlier policy projections. In 2019, NITI Aayog and the Rocky Mountain Institute projected 80 per cent electric two-wheeler penetration in new sales by 2030. A 2022 NITI Aayog exercise with BCG revised that to 35 to 40 per cent.[23] Observed penetration remains well below the revised figure. This pattern — growth that is rapid in absolute terms but slower than announced trajectories — recurs across several of the segments examined in this brief.

Heavy freight: Current powertrain mix

Heavy freight shows no material electrification to date. India operates approximately four million diesel trucks, which carry close to 70 per cent of domestic cargo.[24] Medium and heavy-duty trucks constitute around 3 per cent of the vehicle population but account for 45 per cent of on-road emissions on IEEFA's figures, and around 2 per cent and 40 per cent respectively on ICCT's.[25,68] Range and charging economics have kept battery-electric powertrains confined to short-haul and urban duty cycles.

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LNG in road freight: Deployment and price thresholds

LNG is the principal alternative under consideration for this segment, and deployment to date is limited. The Petroleum and Natural Gas Regulatory Board counted approximately 700 LNG-fuelled trucks in India, against more than 725,000 in China, supported by roughly 20 filling stations against more than 6,000 in China.[26] The largest domestic operator runs over 1,000 heavy-duty LNG trucks and plans to scale to 10,000.[24] The chief executive of one refuelling network describes the ecosystem as being at "kindergarten stage".[27]

Stated policy intent is substantially larger than current deployment. The Ministry of Petroleum and Natural Gas has a draft policy to promote conversion of a third of existing long-haul trucks to LNG and to mandate that a third of new trucks run on it.[28] The Petroleum and Natural Gas Regulatory Board (PNGRB) projects the fleet could reach 500,000 by 2040, becoming the preferred long-haul fuel post-2030 — explicitly contingent on LNG priced below approximately US$9 per mmBtu (about CA$12.5/GJ) on a delivered ex-ship basis.[26]

This price condition is central to any assessment of incremental Indian LNG demand in the freight segment.

Industry estimates suggest that replacing 10 per cent of India's diesel trucking fleet with LNG vehicles could reduce annual foreign exchange outflows by close to US$3 billion (or CA$4.2 billion).[24] The government is reported to be evaluating an incentive programme worth over US$1 billion (CA$1.4 billion) for cleaner commercial vehicles.[24]

Crude oil import dependence

India's crude oil import dependence reached a record 88.7 per cent in FY26 on provisional data, up from 85.5 per cent in FY22. Over the same period domestic crude production fell from 29.7 to 28.0 Mt, attributed to natural decline in mature fields.[29]

In volume terms, crude oil imports were 245 Mt in FY2025–26, against imports of approximately 224 Mt FY23. LNG imports were 34,427 MMSCM (1.31 EJ[†]) in FY26, down from 35,720 MMSCM (1.36 EJ) in FY25.6970 The LNG decline is attributable to price and to the 2026 supply disruptions rather than to any fall in underlying demand: in April 2026 alone, natural gas consumption fell 16.7 per cent year on year and LNG imports 29.6 per cent, with the rupee at 95.24 to the dollar.[71]

None of the substitution trends described in this brief materially alters this position within the current investment cycle.

Box 1: Modelled projections

CEEW analysis of India's road transport sector projects gasoline demand peaking at 1.9 exajoules in 2032 and diesel demand peaking at 6.4 EJ in 2047, with total road transport energy demand roughly doubling from 5.3 EJ in 2023 to 10.7 EJ in 2050 — and with electric vehicles reaching 74 per cent of vehicle stock by 2050 while contributing only about 1.5 EJ of energy demand, reflecting powertrain efficiency.[30] For comparison with current consumption: petroleum product demand in FY2025–26 included approximately 93 Mt of high-speed diesel and 42 Mt of gasoline, or 41.1 per cent and 17.1 per cent of total product demand respectively.[72] Converted at standard calorific values and adjusted for the share of diesel consumed outside road transport, road-sector gasoline demand is currently of the order of 1.7 to 1.8 EJ against the projected peak of 1.9 EJ, and road-sector diesel demand of the order of 2.8 to 3.0 EJ against the projected peak of 6.4 EJ. On this basis gasoline is within roughly 10 per cent of its modelled peak, while diesel would more than double.

Other credible estimates differ materially. Reliance Industries has publicly projected Indian gasoline demand peaking by 2035 and diesel by 2041 or beyond.[31] The range between these estimates is wide, and any single peak-demand year should be treated as a function of the underlying assumptions rather than as an observed result.

† The conversion factor between cubic meters and Joules depends on the origin of the natural gas under consideration. For Russian natural gas at 15°C and atmospheric pressure, 1 million cubic meters corresponds in average to 38.2 terajoules of energy. This is the factor we use here.

Section 3: Industry and households — costs of alternative fuels

Carbon border adjustment: Status and estimated cost

The European Union's Carbon Border Adjustment Mechanism entered its financial phase on 1 January 2026, applying a carbon cost to Indian steel and aluminium entering the EU.[32]

Published estimates of the cost vary widely and are set out below with their sources. The Global Trade Research Initiative suggests exporters may need to reduce prices by 15 to 22 per cent to absorb it.[32] A study by the Foundation for European Progressive Studies and India's National Institute of Public Finance and Policy put the duty at approximately €173.8 ($CA280.6) per tonne of steel, equivalent to around 16 per cent of unit export value.[33] BCG analysis suggests Indian steel exporters face a 32 per cent cost increase by 2032, the steepest of any exporting country.[34]

Emissions intensity of coal- and gas-based DRI

Emissions intensity data indicate the direction of industrial fuel switching. Coal-based direct reduced iron production in India yields roughly 0.8 to 1.2 tonnes of carbon dioxide per tonne of DRI, against 0.4 to 0.6 tonnes for natural gas-based operations.[35] Gas-based DRI is not a long-term decarbonisation option, but it is the step available within the current capital cycle that materially changes a CBAM declaration.

> Gas-based DRI is not a long-term decarbonisation option, but it is the step available within the current capital cycle.

Switching is nonetheless partial, for structural reasons. India has over 1,091 crude steel producers and more than 1,200 re-rollers operating widely differing technologies, from blast furnace-BOF through coal-DRI to electric arc furnace.[34] Given this heterogeneity, switching is concentrated among large producers with direct EU exposure and sufficient balance sheet capacity.

Green hydrogen: Commissioned capacity and price discovery

As of February 2026, approximately 8,000 tonnes per year of green hydrogen capacity had been commissioned, against a National Green Hydrogen Mission target of 5 million tonnes per year by 2030.[36]

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Price outcomes have moved ahead of commissioned capacity. In reverse auctions conducted in August and September 2025, the Solar Energy Corporation of India cleared 13 green ammonia projects at prices between ₹49.80 ($CA0.72) and ₹64.70 ($CA0.93) per kilogram, against a global benchmark nearer ₹110 ($CA1.59) per kilogram — the first credible indication that a green hydrogen derivative can compete commercially in India.[37]

The implication for import demand parallels that for liquefied petroleum gas (LPG) discussed below: approximately 86 per cent of the ammonia consumed in India depends on imports, whether of ammonia itself, of the natural gas used to make it, or of ammonia embedded in imported fertiliser products.[37] Domestic green ammonia would displace these imports, and the prices discovered in 2025 suggest such displacement is feasible within the decade.

For steel, the timeline is longer. CEEW analysis indicates that blending around 9 per cent green hydrogen with grey is competitive against the upper range of blast furnace costs at current prices, that blends up to 60 per cent could break even with average blast furnace costs by 2030, and that 100 per cent green hydrogen uptake breaks even with the lower range of blast furnace costs by 2040.[38]

LPG: Import exposure and routing

The headline LPG import share understates India's exposure. Direct imports account for approximately 60 per cent of consumption: PPAC data show FY25 domestic production of about 12.8 million metric tonnes against consumption of 31.3 Mt.[39] But the domestically produced share is predominantly refinery output from crude oil that is itself 88.7 per cent imported.[29] Combining the two gives an effective upstream import exposure of approximately 95 per cent. A modest share of domestic LPG derives from natural gas fractionation rather than refining, which adjusts the figure marginally downward, but the order of magnitude holds.

Routing is similarly concentrated. Approximately 90 per cent of India's LPG imports transit the Strait of Hormuz.[40] It is worth noting that the US has emerged as an important source of imported LPG on account of recent agreements and an expectation to increase India's imports from the US.

> The expansion of access has therefore established a household energy system dependent on a largely imported fuel arriving predominantly through one maritime corridor.

India has extended LPG access rapidly: over 33.2 crore (332 M) active connections, including more than 10 crore (100 M) beneficiaries under the Pradhan Mantri Ujjwala Yojana.[39] The expansion of access has therefore established a household energy system dependent on a largely imported fuel arriving predominantly through one maritime corridor.

LPG supply and consumption, March 2026

In March 2026, following the closure of the Strait of Hormuz, LPG consumption fell 12.8 per cent year on year to 2.379 Mt.[39] The government cut supplies to commercial establishments and industry to protect household availability, extended the minimum interval between domestic bookings from 21 to 25 days, and imposed a 45-day cycle on rural consumers.[41] On 8 March it directed refineries and petrochemical complexes to divert propane, butane, propylene and butene streams into the LPG pool, lifting domestic production by roughly a quarter.[40]

One qualification applies to these figures. The administrative measures included interventions against diversion of domestic cylinders into commercial channels, which implies that pre-crisis consumption data may have been somewhat overstated.[42] Part of the recorded decline may therefore reflect reduced diversion rather than reduced household consumption, and the year-on-year comparison should be treated accordingly.

Electric cooking: Economics and adoption constraints

Electric cooking is available at national scale in terms of technology, appliance supply and electricity connections, and adoption remains low. CEEW's India Residential Energy Survey found electric cooking adoption at approximately 5 per cent of Indian kitchens.[43]

Operating cost does not appear to be the binding constraint. CEEW analysis finds electric cooking operationally cost-effective against an unsubsidised LPG refill at electricity tariffs below roughly ₹6.6 ($CA0.09) per kWh, and against subsidised LPG below roughly ₹5 ($CA0.07) per kWh — with the qualification that heavy cooking loads risk pushing households into higher tariff slabs.[44] IEEFA analysis published in October 2025 puts electric cooking at 37 per cent cheaper than LPG and 14 per cent cheaper than piped natural gas, while noting that nearly 40 per cent of Indian households still rely on solid fuels.[45]

Two other constraints are more significant. The first is emissions: given the carbon intensity of grid electricity, electric cooking is currently less preferable than LPG or Piped Natural Gas (PNG) on an emissions basis, so the case for it rests on import substitution and household economics rather than on decarbonisation.[43] The second is the electricity connection: induction cooking typically requires a 25-amp supply, whereas most rural households operate on 5-amp or 10-amp connections designed for lighting and fans.[46] Upgrading connections at this scale is a substantial undertaking.

> Relative price alone is unlikely to reallocate household energy demand quickly.

India's most import-exposed household fuel therefore has a lower-cost domestic substitute that has been available for a decade and is used in approximately one household in 20. This suggests that relative price alone is unlikely to reallocate household energy demand quickly.

Section 4: Sourcing considerations for Indian buyers

The volume of India's oil and gas imports over the longer term will depend on the pace at which the substitutions described above scale. The terms on which imports are secured are being set now, and buyer priorities changed over 2025 and 2026.

Gas market context

India's natural gas demand reached approximately 71 billion cubic metres in FY2024–25, with roughly half met by LNG imports.[47] LNG imports were around 25 to 25.5 million tonnes in 2025; Petronet LNG forecasts 28 to 29 Mt for 2026.[48] India targets natural gas at 15 per cent of its primary energy mix by 2030, but there haven't been recent updates to this policy position nor a clear move away from the earlier stated position.[47] Qatar has historically supplied 40 to 42 per cent of India's LNG imports and Australia 22 to 25 per cent.[49]

Price indexation: Contracted positions and outcomes

Indian buyers signed a series of LNG supply agreements linked to the US Henry Hub benchmark in late 2024 and early 2025, explicitly to diversify away from oil-linked pricing and to secure what was expected to be a more stable anchor.[50]

Outcomes over 2025 and 2026 did not follow that expectation. Henry Hub strengthened while crude-linked and spot prices softened. On Argus forward curves, delivered LNG under Henry Hub-linked contracts for Indian city gas firms was expected to average around US$13.40 per mmBtu (about CA$18.6/GJ) in 2026, with GAIL's Henry Hub-linked import price near US$12.80 (CA$17.7) — against US$8.80 (CA$12.2) for crude-linked term LNG, US$9.72 (CA$13.5) for domestic high-pressure high-temperature gas and US$6.55 (CA$9.0) for domestic conventional gas. Approximately 2.95 Mt of supply, some 12 per cent of India's import volumes, sits in this exposed category, with the rupee at a record low of 90 to the dollar compounding the effect.[50]

Buyer statements since indicate a shift in preference. Petronet LNG's managing director has stated that India needs more oil-linked contracts because Henry Hub is too volatile.[48] Senior officials at state refiners reported cooling appetite for long-term US LNG through late 2025.[51]

The evidence does not indicate a settled preference for either index. Indian buyers have been exposed on both within 18 months, and appear to be seeking diversification across indexation bases rather than a single anchor. Suppliers able to offer optionality between bases, or hybrid structures, address a demonstrated rather than an assumed requirement.

Contractual flexibility and term commitments

Indian buyers value the ability to redirect cargoes and to manage seasonal swing, which argues for free-on-board terms over rigid delivered ex-ship structures. But that preference is being constrained by their own contracting behaviour: long-term contracted volumes are rising from 22 to approximately 27 Mt/y by 2026, which mechanically reduces the share of the portfolio available to capture cheap spot cargoes.[12]

Buyers are therefore seeking flexibility while contracting in ways that reduce their capacity to exercise it. Propositions based on flexibility should be assessed against the uncommitted share of a given buyer's portfolio.

Transit security: The 2026 disruptions

Chokepoint exposure can now be assessed against operational experience rather than as a prospective risk.

Approximately 52 per cent of India's roughly 5 million barrels per day of crude imports transit the Strait of Hormuz — up from 41 per cent in 2025, as refiners reduced Russian purchases.[52] India's strategic petroleum reserves hold about 9.5 days of net oil imports; combined with state oil company storage, total national capacity is around 74 days of net imports. There is no comparable strategic reserve for natural gas.[52]

Following the closure of the Strait in early 2026 after US and Israeli strikes on Iran, the response on crude was rapid and largely effective. A 24-hour control room was established in the petroleum ministry and the Directorate General of Shipping from 28 February.[40] By 11 March the ministry stated that around 70 per cent of crude imports were arriving from outside Hormuz, sourced across roughly 40 countries.[53] On 9 March a Natural Gas Control Order was issued under the Essential Commodities Act, allocating domestic piped gas and transport CNG at 100 per cent of requirement, industrial consumers at around 80 per cent of trailing average, fertiliser plants at around 70 per cent, and cutting refineries and petrochemical units by around 35 per cent.[40]

Crude proved diversifiable at additional cost. Gas and LPG did not, given fewer alternative sources, the absence of strategic reserves and more concentrated routing. When the Strait closed again in July 2026, the government stated cover of 60 days of crude, 60 days of LNG and 45 days of LPG.[54]

Delivered-price thresholds by segment

Two delivered-price thresholds identified above govern incremental gas demand:

- **Approximately US$9/mmBtu (CA$12.5/GJ) DES** is the level below which PNGRB assesses LNG as economically attractive against diesel for long-haul trucking.[26]
- **Approximately US$6/mmBtu (CA$8/GJ)** is the level at which India's existing stranded gas-fired power fleet becomes structurally competitive, with the upside concentrated in reactivating idle plant rather than new build.[12]

Both are observable conditions rather than forecasts, and can be tested against prevailing delivered prices.

Canadian supply against these criteria

Canada's position against these criteria is mixed.

On price and freight, Canada is at a disadvantage. Pacific routing from Canada's west coast to Indian import terminals involves materially longer transit distances than Middle Eastern routes, creating a structural cost differential. The India–Canada Energy Dialogue's joint work plan is specifically tasked with developing commercially viable solutions to this logistics challenge.[55] Canada ranks fifth globally in natural gas production but only 14th in LNG exports, a legacy of decades of pipeline integration with the United States, to which it currently sends 97 to 98 per cent of its energy exports.[49]

On availability, the near-term picture is constrained. LNG Canada Phase 1 offtake is contracted to Japanese, Chinese and Korean buyers; Phase 2 represents the realistic entry point for Indian participation, whether as customer or as investor.[56] Canada has stated a goal of producing 50 Mt of LNG per year by 2030 and up to 100 Mt by 2040.[57] In crude, Canadian volumes reach India at approximately 150,000 barrels per day against roughly one million from Iraq, and Canadian ministers have reported Indian interest in west coast loading specifically for the shorter voyage.[58]

On transit security, Canadian supply does not transit the Strait of Hormuz. On the evidence of 2026, this is an attribute Indian buyers have had direct reason to value, and LPG diversification has already begun shifting toward North American supply, including a 2.2 Mt per year US LPG agreement signed in November 2025.[59]

Institutional context

India and Canada announced the launch of negotiations toward a Comprehensive Economic Partnership Agreement in November 2025. Terms of reference were signed on 2 March 2026. The second round of negotiations was held in New Delhi from 4 to 8 May 2026[60], and the third in Ottawa from 6 to 10 July 2026, with both sides reaffirming an intention to conclude negotiations during 2026.[61] A January 2026 joint statement issued around India Energy Week framed Canada as a secure and reliable supplier and placed LNG, LPG, crude and refined products at the centre of the expanded relationship.[62]

This brief takes no view on the terms under negotiation. Regulatory predictability is among the attributes Indian buyers weigh, and the institutional framework for it is under construction.

Indicators to monitor as we look ahead

The following indicators are observable at monthly or annual frequency and will register change before any demand projection can be assessed:

- Penetration in the L5 three-wheeler and heavy commercial vehicle segments, as distinct from headline EV totals;
- Battery storage commissioned against storage tendered, and the cancellation rate;
- The LNG truck fleet and filling station count, against the PNGRB trajectory;
- Gas-fired plant load factor against delivered LNG price, as the direct test of the US$6 threshold;
- Electric cooking appliance sales, particularly two-burner units, following the 2026 LPG disruption;
- The share of India's crude and LNG imports routed outside the Strait of Hormuz, and whether the diversification achieved under duress in 2026 persists.

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LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
BCG	Boston Consulting Group
BOF	Basic oxygen furnace
CBAM	Carbon Border Adjustment Mechanism
CEEW	Council on Energy, Environment and Water
CNG	Compressed natural gas
DES	Delivered Ex-Ship
DRI	Direct reduced iron
EJ	Exajoules
EV	Electric vehicle
FY	Fiscal year
GAIL	Gas Authority of India Ltd.
GJ	Gigajoules
GW	Gigawatts
GWh	Gigawatt-hour
ICCT	International Council on Clean Transportation
IEA	International Energy Agency
IEEFA	Institute for Energy Economics and Financial Analysis
kWh	Kilowatt-hour
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
M	Million
mmBtu	Million British thermal unit
MMSCM	Million Metric Standard Cubic Meters
Mt	Million tonnes
MW	Megawatt
NITI Aayog	National Institution for Transforming India Aayog
PNG	Piped natural gas
PNGRB	Petroleum and Natural Gas Regulatory Board
PPAC	Petroleum Planning & Analysis Cell

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