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EDITORIAL ANALYSIS

Energy Security and LPG Demand — India's Clean Cooking Challenge

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The Indian Express

MAINS RELEVANCE:

GS Paper 3

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INTERVIEW ANGLE

"India's LPG drive through PMUY has extended access to millions, but low refill rates reveal that energy access is not the same as energy security. How should India bridge the gap between fuel access and actual adoption for clean cooking?"

WHY IN NEWS

India's rising LPG demand is straining the country's import-heavy supply chain at a time when West Asia geopolitics, Houthi attacks on Red Sea shipping, and volatile Saudi Aramco Contract Prices are elevating supply risks — raising urgent questions about India's clean cooking energy security and the fiscal sustainability of LPG subsidies.

INDIA AND LPG — SCALE AND SIGNIFICANCE

India is the **world's second-largest LPG consumer** after China. Liquefied Petroleum Gas (LPG) — primarily a mixture of propane and butane — is India's dominant cooking fuel in urban and semi-urban households.

Key Statistics

Indicator	Data
Annual LPG consumption	~26–27 million metric tonnes (MT)
LPG connections	~320+ million households
Import dependence	~50–55% (imported from Middle East)
PMUY beneficiaries	~9.59 crore (Pradhan Mantri Ujjwala Yojana)
PMUY subsidy per cylinder	₹300 (since June 2023)

WHY LPG MATTERS FOR UPSC

Health and Gender Dimensions

Traditional biomass cooking (firewood, cow dung, crop residue) causes severe **indoor air pollution** — responsible for:

- ~600,000–800,000 deaths per year in India (WHO estimates) from household air pollution

- Disproportionate burden on **women and children** who spend more time near cooking fires

- PM2.5 particulate matter from biomass combustion = 16 cigarettes per day (equivalent exposure)

LPG is a **clean cooking fuel** by WHO standards — no indoor smoke, efficient combustion, time savings.

The PMUY Success and Its Limit

Pradhan Mantri Ujjwala Yojana (PMUY) launched in 2016 (Phase 1) and expanded as **PMUY 2.0** in 2021:

Objective: Provide LPG connections to Below Poverty Line (BPL) women

Achievements: Over 9.59 crore free LPG connections distributed

Problem: Average refill rate among PMUY beneficiaries is significantly lower than non-PMUY households

Why low refill rates?

- LPG cylinder costs ₹800–900 (market price); subsidy brings it to ~₹500–600, but still unaffordable for poorest households

- Cultural habit: rural women familiar with firewood cooking; smoke seen as mosquito repellent in some communities

- Availability: LPG distributors not always accessible in remote areas

This gap between **access (connection) and usage (refills)** is India’s clean cooking challenge.

IMPORT DEPENDENCE AND SUPPLY RISKS

India imports approximately **55% of its LPG needs**. The major sources are:

Country/Region	Share
Saudi Arabia (Aramco)	~40–45% of imports
UAE (ADNOC)	Significant share
Other Middle East + USA	Remainder

The Saudi Aramco Contract Price (CP) Mechanism

India’s LPG import prices are linked to **Saudi Aramco’s monthly Contract Price (CP)** — the benchmark for global LPG trade. When oil prices rise or Saudi Arabia adjusts production, CP moves accordingly, directly impacting India’s import bill.

Red Sea Disruption (2023-24)

Houthi attacks on commercial shipping in the Red Sea forced many LPG tankers to reroute via the **Cape of Good Hope** (around Africa), adding:

- ~10–14 days of sailing time per voyage
- \$2–3 million extra cost per large LPG tanker trip
- Tightening of LPG spot markets globally

India’s state-owned oil marketing companies (IOC, BPCL, HPCL) absorb these costs or pass them through to the government subsidy bill.

DOMESTIC LPG SUPPLY CHAIN

India has domestic LPG production from:

- ONGC and Oil India Limited (OIL)** — associated gas from oil fields
- Refineries:** IOC, BPCL, HPCL refineries produce LPG as a petroleum product
- But domestic production meets only ~45–50% of demand

Oil Marketing Companies (OMCs)

The three state-owned OMCs dominate LPG distribution:

Indian Oil Corporation (IOC) — IndanGas

Bharat Petroleum Corporation Limited (BPCL) — BharatGas

Hindustan Petroleum Corporation Limited (HPCL) — HP Gas

OMCs operate ~27,000+ LPG distributors across India.

ALTERNATIVES TO LPG

Compressed Biogas (CBG) — SATAT Scheme

The **Sustainable Alternative Towards Affordable Transportation (SATAT)** initiative (2018) aims to produce **15 million MT of CBG** by 2023-24 (target extended). CBG is produced from biomass, agricultural residue, and municipal solid waste — a domestic substitute for LPG.

CBG has the same composition as CNG (Compressed Natural Gas)

Can be blended with LPG in cooking applications

Reduces import dependence + addresses agricultural stubble burning

Piped Natural Gas (PNG)

For urban households, **Piped Natural Gas** delivered through city gas distribution (CGD) networks is increasingly replacing LPG cylinders. PNG is cheaper, safer (no cylinder handling), and cleaner. PNGRB (Petroleum and Natural Gas Regulatory Board) is expanding CGD coverage.

FISCAL DIMENSION

India's **LPG subsidy bill** has been a significant fiscal variable:

2022-23: LPG subsidy surged as global prices rose post-Ukraine war

2023-24: Global prices moderated; PMUY-specific ₹300/cylinder subsidy introduced

Non-PMUY cylinders: deregulated (market prices, no subsidy)

DBT (Direct Benefit Transfer): Since 2014-15, LPG subsidies are transferred directly to beneficiary bank accounts — reducing diversion and targeting improvement.

UPSC RELEVANCE

Prelims: PMUY, PMUY 2.0, OMCs (IOC/BPCL/HPCL), Saudi Aramco Contract Price, SATAT scheme, PNGRB, PAHAL/DBT for LPG.

Mains GS-3: “Despite 9.5 crore PMUY connections, India’s clean cooking transition remains incomplete. Examine the reasons and suggest a comprehensive strategy for universal clean cooking access.”

Mains GS-2: “How has DBT transformed LPG subsidy delivery? Evaluate its successes and limitations.”

★ FACTS CORNER — KNOWLEDGE PEDIA
INDIA'S LPG POSITION:

- Global rank: 2nd largest LPG consumer (after China)
- Annual consumption: ~26-27 million metric tonnes
- Import dependence: ~50-55%
- Primary import source: Saudi Arabia (via Saudi Aramco CP mechanism)

PMUY (PRADHAN MANTRI UJJWALA YOJANA):

- Launched: May 2016 (World Environment Day) by PM Modi in Ballia, UP
- PMUY 2.0: launched August 2021
- Beneficiaries: 9.59 crore (as of 2024)
- Target group: BPL women
- Current subsidy: ₹300 per cylinder for PMUY beneficiaries (since June 2023)

LPG TECHNICAL FACTS:

- LPG composition: primarily propane + butane
- Domestic cylinder capacity: 14.2 kg; 5 kg also available
- Calorific value: ~46 MJ/kg (higher than coal ~26 MJ/kg)
- LPG vs PNG vs CNG: LPG = propane/butane (stored as liquid); PNG = methane piped; CNG = methane compressed

DISTRIBUTION:

- IOC: IndanGas; BPCL: BharatGas; HPCL: HP Gas
- LPG distributors in India: ~27,000+
- PAHAL scheme: DBT scheme for LPG; world's largest cash transfer scheme (Guinness World Record 2015)

ALTERNATIVES:

- SATAT: Sustainable Alternative Towards Affordable Transportation; CBG production target 15 MMT
- CBG: Compressed Biogas; produced from agricultural residue, MSW, bio-waste
- PNGRB: Petroleum and Natural Gas Regulatory Board; regulates CGD networks
- CGD: City Gas Distribution; piped gas to households and CNG to vehicles

HEALTH IMPACT:

- WHO: ~3.2 million deaths globally per year from household air pollution (HAP)
- India share: ~600,000-800,000 deaths from solid fuel combustion (biomass)
- Clean Cooking Energy Mission: part of India's NDC commitments

OTHER RELEVANT FACTS:

- ONGC: Maharatna PSU; largest domestic LPG producer
- Oil India Limited (OIL): Navratna PSU; Assam-based; LPG production
- India's LPG cylinder colour code: red (domestic 14.2 kg); blue (5 kg); commercial cylinders different
- DBT for LPG: ₹30,000+ crore transferred annually to ~300 million households

Sources: Indian Express, Ministry of Petroleum and Natural Gas, PPAC

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