December 2025

Institute for Energy Economics and Financial Analysis

Bangladesh's energy efficiency goals within reach

Regulatory framework and awareness create a favourable ecosystem to enhance energy efficiency amid supply disruptions and rising tariffs, with further gains possible

Shafiqul Alam, Lead Energy Analyst - South Asia, IEEFA

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Key findings

In less than a decade, Bangladesh improved energy efficiency by 13.64%, an annual gain of 1.52%. In FY2023-24 alone, fossil fuel consumption of 7 million tonnes of oil equivalent (Mtoe) was avoided, slashing import bills by USD3.3 billion.

This sustained national effort created a framework for energy efficiency. However, after initial gains from FY2016-17, progress slowed until FY2020-21 when energy supply disruptions and higher tariffs made efficiency a priority.

Bangladesh is on course to achieve its energy efficiency targets a year early. With households and industry consuming two-thirds of the country's energy, these sectors should be the focus for greater energy efficiency gains.

Proper standards and labels, and passive design features, will ensure optimal energy efficiency in buildings. In industry, efficiency improvements in motors, motor drives and captive power generation, and switching to electric boilers, will slash energy consumption.

Executive summary

In 2016, beset with energy security concerns and rising import bills, Bangladesh devised a master plan to improve national energy efficiency. Now, nine years later, these efforts are paying off. Between fiscal year (FY) 2014-15 and FY2023-24, energy efficiency increased by 13.64% against a target of 20% by 2030.[1] In FY2023-24 alone, energy efficiency gains helped Bangladesh cut fossil fuel consumption worth 7 million tonnes of oil equivalent (Mtoe), avoiding approximately USD3.34 billion in import bills.

> **Initially, the country's energy consumption and gross domestic product (GDP) trends showed signs of efficiency improvement from FY2016-17. However, progress slowed until FY2020-21, when it regained momentum as energy supply disruptions, led by global fossil fuel price volatility and subsequent energy tariff hikes, made energy efficiency a priority.**

Initially, the country's energy consumption and gross domestic product (GDP) trends showed signs of efficiency improvement from FY2016-17. However, progress slowed until FY2020-21, when it regained momentum as energy supply disruptions, led by global fossil fuel price volatility and subsequent energy tariff hikes, made energy efficiency a priority.

Bangladesh's average annual energy efficiency improvement rate hovers around 1.52%, a trend that will likely help the country achieve its 2030 goal a year ahead of the deadline. While the updated Nationally Determined Contributions (NDC 3.0) incorporated an energy efficiency target of 19.2% by 2035 from 2022 levels, this study finds Bangladesh is also on course to reach that target a year early.

As households and industries are responsible for roughly two-thirds of Bangladesh's energy consumption, this study highlights the critical importance of frontloading energy efficiency in these two sectors to achieve the country's 2030 and 2035 targets. At the household level, energy efficiency labels will help drive greater adoption of efficient appliances amid information asymmetry (on minimum energy performance standards) in the market. In industry, significant gains can be made through efficiency enhancement in motors, motor-driven systems and captive generators, and a transition from gas to electric boilers. Similarly, energy efficiency labels and passive design are key to reducing energy consumption in the commercial sector, where cooling demand is high.

Bangladesh should build on its regulatory framework that laid a strong foundation for energy efficiency in less than a decade, contributed by the Sustainable and Renewable Energy Development

[1] This study has considered FY2014-15 as the base year. SREDA shifted the base year from FY2013-14 to FY2014-15 in its analysis of April 2024.

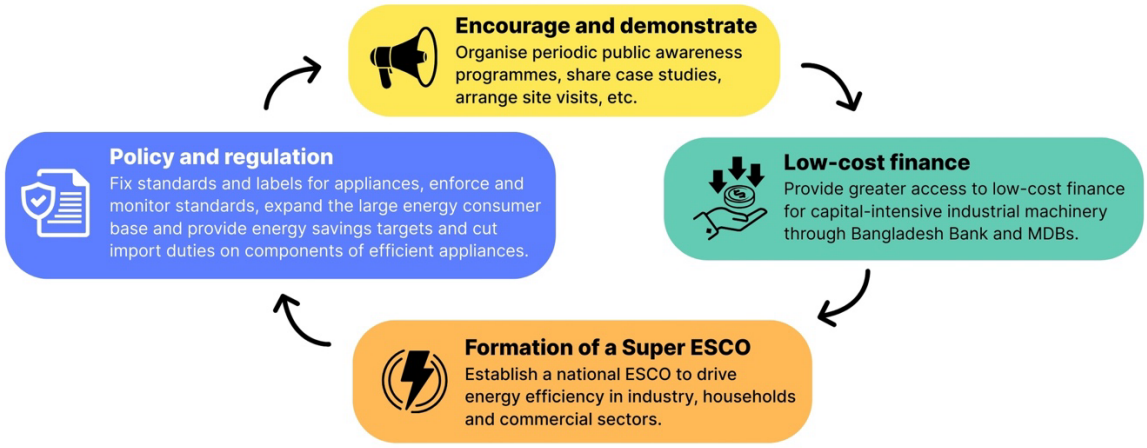
Authority (SREDA). This study recommends measures to further improve the country's energy efficiency ecosystem (Figure 1 below. See Table 4 for full details.):

- SREDA should organise events to raise awareness on energy efficiency, including technical and information sessions.
- SREDA should prioritise establishing standards and labels for appliances, widen the base of large energy consumers, and gradually provide energy savings targets to large consumers to ensure the desired level of efficiency.
- As cooling demand will surge owing to global mean temperature rises, Bangladesh should enforce the National Building Code 2020 to encourage passive design in new buildings, reducing the application of energy-intensive air conditioners.
- SREDA should engage with the National Board of Revenue (NBR) to rationalise high import duties on efficient appliance components to reduce upfront costs.
- The Bangladesh Bank should ensure the greater access of low-cost finance, and may explore designing new financing scheme for capital intensive energy efficiency projects, supported by multilateral development banks (MDBs).
- Bangladesh may establish a super Energy Service Company (ESCO) to drive energy efficiency in households, industry and commercial sectors.
- SREDA should also craft a monitoring framework to track progress, assess loopholes in existing policies and regulations, and undertake corrective measures as needed.

> **Energy efficiency goes beyond reducing bills. It offers a buffer against global price shocks and supply chain disruptions that stifle industrial production and business.**

Energy efficiency goes beyond reducing bills. It offers a buffer against global price shocks and supply chain disruptions that stifle industrial production and business. For Bangladesh, energy efficiency is a strategic imperative to limit unabated energy consumption and enhance energy system resilience. While efficiency can quickly transform the national energy system, Bangladesh must pursue a co-ordinated approach to establish synergy among regulatory authorities, energy consumers (e.g., industries), financial institutions and technology providers.

Figure 1: Steps to improve Bangladesh’s energy efficiency ecosystem



Background

In fiscal year (FY) 2014-2015, spiralling energy demand and an anticipated decline in local gas production put Bangladesh in a dilemma of how to ensure uninterrupted energy supply to propel economic growth while keeping prices affordable. With its dependence on imported fossil fuels to meet energy demand likely to grow, the Bangladesh government formulated the Energy Efficiency and Conservation Master Plan in 2016. It set targets to reduce energy intensity by 15% and 20% by 2021 and 2030, respectively (base year FY2013-14).[2,3,4&5] The Master Plan covers the industrial, household and commercial sectors.

Bangladesh's Sustainable and Renewable Energy Development Authority (SREDA) crafted regulations and guidelines between 2016 and 2024 to lay the foundations for energy efficiency uptake.[6] SREDA certified energy auditors and managers to identify energy-saving opportunities and manage systems optimally. Besides, two batches of large consumers were selected for mandatory energy audits, comprising 189 entities from the industry, commercial, and residential sectors.[7] Then, the Bangladesh government, as part of its third Nationally Determined Contributions (NDC 3.0), targeted improving energy efficiency by 19.2% between 2022 and 2035 (Table 1).[8]

While this new energy efficiency target exhibits the Bangladesh government's strong commitment to minimise wasteful energy consumption, it also substantiates the necessity of frontloading sustained measures over the next decade.

Against this background, this study analyses Bangladesh's primary energy consumption and gross domestic product (GDP) trends over the past decade to examine the country's progress on energy efficiency. It analyses the factors that primarily induced energy efficiency in the country. It then identifies the key sectors on the demand side and suitable technologies the country should explore in the next decade to improve energy efficiency further. This study concludes with key recommendations to drive Bangladesh's energy efficiency on the demand side.

[2] Sustainable and Renewable Energy Development Authority (SREDA). Energy Efficiency and Conservation Master Plan up to 2030. May 2016.
[3] In this study, we have used FY2014-15 as the base year. SREDA shifted the base year from FY2013-14 to FY2014-15 in its analysis of April 2024.
[4] Energy intensity is defined as the quantity of energy required to produce a given output. For example, energy required to produce GDP of 1,000 Bangladeshi Taka (See Annexure 1 for details).
[5] When calculating energy intensity, biomass is excluded.
[6] SREDA. Acts, Rules, Regulations, Policies & Other. 2025.
[7] SREDA. List of Designated Consumers. 12 May 2024.
[8] Ministry of Environment, Forest and Climate Change (MOEFCC). Bangladesh's Third Nationally Determined Contribution (NDC 3.0). September 2025.

Table 1: Policies and regulations for energy efficiency

Policy/regulation	2016	2021	2023	2024	2025	2027	2030	2035
Energy Efficiency and Conservation Master Plan 2016*	15% reduction in energy intensity from FY2013-14 level.							
	20% reduction in energy intensity from FY2013-14 level.							
Revised Energy Efficiency and Conservation Rules, 2023 (first issued in 2016)			Identified 18 appliances for energy efficiency labels by 2027.					
			Fixed minimum criteria (energy consumption) for large energy consumers (designated consumers) of different sectors in 2023.					
			Set energy efficiency benchmarks for some machinery with more to be added.					
Energy Efficiency Labelling Regulations, 2023			Laid the foundation for setting minimum energy performance standards (MEPS) of appliances and energy efficiency labels.					
Energy Audit Regulations, 2023 (SREDA issued previous version in 2018)			Fixed qualifications and roles of energy auditors and energy managers, criteria for recruiting an energy manager, and structure of energy audit reports.					
Guidelines for Building Energy Efficiency and Environment Rating, 2023			Incorporated rating process to enhance energy and resource efficiency in buildings, accelerating adoption of green buildings.					
Circular for list of Designated Consumers 2024 (first issued in 2022)				Included 189 designated consumers that must conduct energy audits and submit reports to SREDA				
Third Nationally Determined Contribution (NDC 3.0)				19.2% improvement in energy efficiency compared with 2022 level.				

*Sources: SREDA; MOEFCC; IEEF; Note: *The Integrated Energy and Power Master Plan (IEPMP) 2023 incorporated the 20% energy intensity reduction target set in the Energy Efficiency and Conservation Master Plan 2016. The IEPMP assumed that under the Advanced Technology Scenario, Bangladesh should strive to enhance efficiency by 38% between 2030 and 2040, and 59% between 2030 and 2050. As the IEPMP is being revised, this study considers energy efficiency targets of 2030 and 2035 set out in the Energy Efficiency and Conservation Master Plan 2016 and the NDC 3.0. (Note: Under the Advanced Technology Scenario, the IEPMP proposed that Bangladesh will likely deploy advanced, cleaner and efficient technologies compared with the business-as-usual scenario).*

Bangladesh's energy efficiency progress and drivers

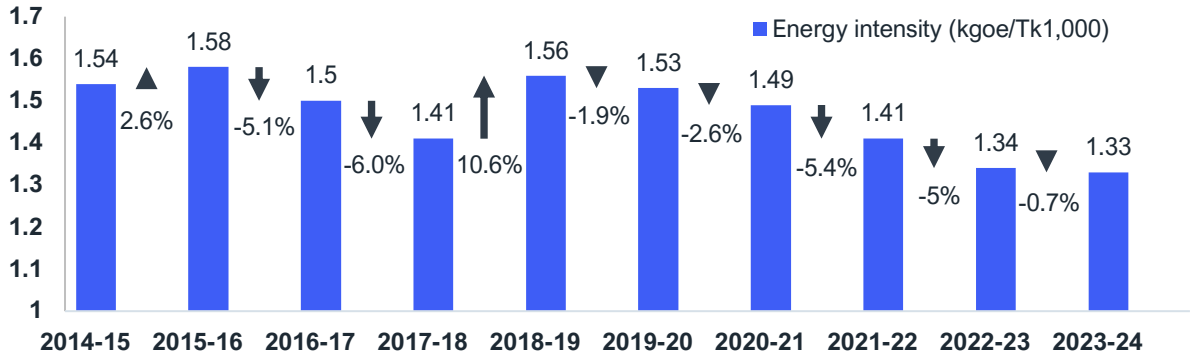
Energy consumption decouples from GDP growth

IEEFA's assessment, based on primary energy consumption and GDP growth rates, shows Bangladesh reduced its energy intensity by 13.64% between FY2014-15 and FY2023-24, registering an average energy efficiency improvement of 1.52% (Figure 2; see Annexure 1 for details).[9,10,11&12] While year-on-year variation on energy efficiency gain is visible, the average improvement still provides a trend to gauge the progress towards targets.

> **In this time period spanning FY2014-15 to FY2023-24, Bangladesh's per capita GDP grew by 58.6% compared with a 36.9% increase in per capita primary energy consumption, validating the country's progress on energy efficiency.**

In this time period spanning FY2014-15 to FY2023-24, Bangladesh's per capita GDP grew by 58.6% compared with a 36.9% increase in per capita primary energy consumption, validating the country's progress on energy efficiency (Figure 3, left; see Annexure 1 and 2 for details).[13,14] Furthermore, the country's GDP growth decoupled from primary energy consumption in seven of the nine years during that period (Figure 3, right).[15]

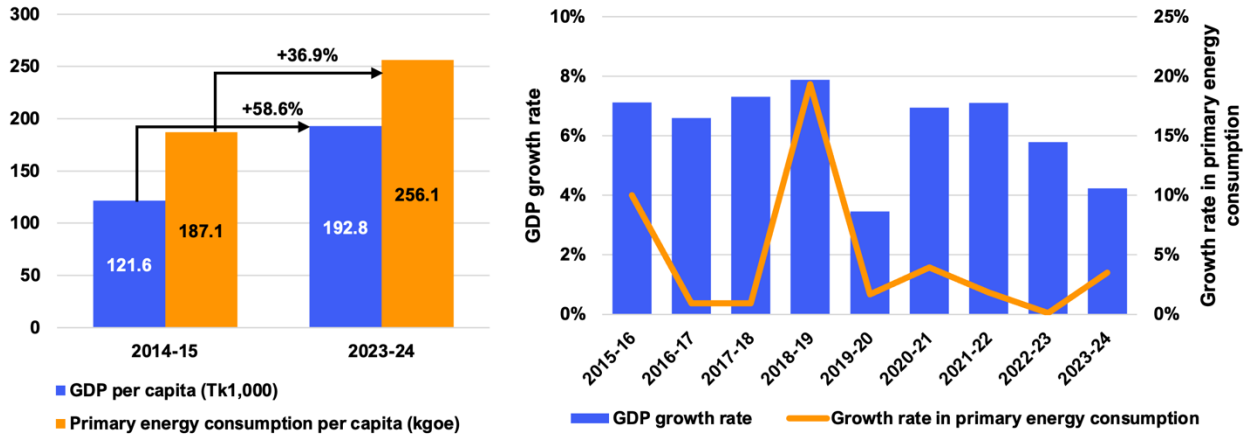
Figure 2: Bangladesh's energy intensity trend, FY2014-15 to FY2023-24



Sources: Bangladesh Bureau of Statistics; The World Bank; Hydrocarbon Unit; IEEFA; Notes: GDP at constant prices and primary energy consumption excluding biomass. FY2014-15 is considered the base year.[16]

[9] Hydrocarbon Unit. Reports on Energy Scenario of Bangladesh 2014-15 to 2023-24. January 2016 to December 2024.
[10] Bangladesh Bureau of Statistics (BBS). Gross Domestic Product (GDP) of Bangladesh 2015-16 to 2023-24. August 2022 to February 2025.
[11] World Bank. GDP (constant Local Currency Unit) – Bangladesh. 7 October 2025.
[12] Biomass is excluded.
[13] Ibid.
[14] World Bank. Population, total – Bangladesh. 25 November 2025.
[15] Footnotes 10-12.
[16] SREDA. National Energy Balance 2021-22. Page 24. April 2024.

Figure 3: Per capita energy consumption growth vs per capita GDP growth (left); energy consumption growth rate vs GDP growth rate (right)



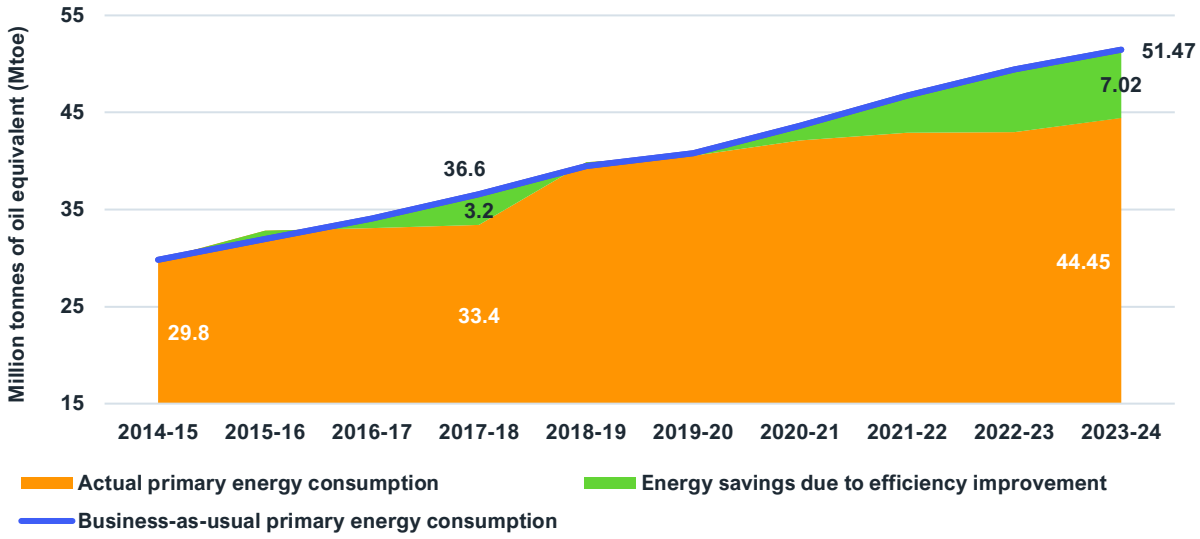
Sources: BBS; World Bank; Hydrocarbon Unit; IEEFA

IEEFA's analysis also reveals energy efficiency helped Bangladesh save primary energy consumption of 7.02 million tonnes of oil equivalent (Mtoe) in FY2023-24 compared with the business-as-usual scenario (Figure 4).[17,18,19] This equates to avoiding USD3.34 billion worth of fossil fuel imports in FY2023-24. Without these efficiency gains, Bangladesh would have imported additional fuels, including LNG, coal, and oil, to meet the 7.02Mtoe of excess energy demand (see Annexure 3 for details).[20,21]

These positive trends highlight the success of the regulatory ecosystem Bangladesh built for energy efficiency in less than a decade. However, after initial gains from FY2016-17, it was business as usual in FY2018-19. Energy efficiency started improving again from FY2019-20 and gained momentum after FY2020-21 amid energy supply disruptions, rising tariffs and growing awareness of the benefits of energy efficiency (Figure 2 and Table 2).

[17] Business-as-usual scenario is based on energy intensity level of FY2014-15 with no energy efficiency improvement until FY2023-24.
[18] In FY2014-15, the energy intensity was 1.54kgoe/Tk1,000. While calculating the business-as-usual energy consumption, the GDP of the corresponding year is used, and the energy intensity is kept constant (the energy intensity of FY2014-15 is used to calculate energy consumption until FY2023-24).
[19] Energy savings: (business-as-usual energy consumption in FY2023-24 – actual energy consumption in FY2023-24).
[20] Due to infrastructure limitations, Bangladesh would not have been able to meet the additional energy demand by importing coal or LNG only. As such, this study considers Bangladesh would have imported an additional 2.34Mtoe each of LNG, coal and oil (total 7.02Mtoe) in FY2023-24.
[21] Import prices and assumptions are provided in Annexure 3.

Figure 4: Energy savings stimulated by energy efficiency



Sources: Hydrocarbon Unit; IEEFA. Note: excludes biomass.

Factors catalysing energy efficiency

Supply concerns over growing energy imports, rising costs, and a growing need for industrial competitiveness contributed to Bangladesh's energy efficiency improvement. Moreover, the government's awareness-raising and capacity-development measures, supported by low-cost finance, prompted energy consumers to invest in energy-efficient technologies and conserve energy (Table 2).

Table 2: Drivers of energy efficiency

Energy supply disruptions	Bangladesh's local gas production peaked between FY2015-16 and FY2018-19 before declining.[22] Gas supply shortages crossed 1,000 million cubic feet per day (MMcfd) against demand of ~4,000MMcfd.[23] A gas supply crunch, coupled with load shedding, affected industrial production. As a result, industries turned to energy efficiency to raise productivity. Between FY2020-21 and FY2023-24, industry's contribution to GDP increased at a faster rate than the country's GDP.[24] Industry's energy efficiency gains are reflected in a 10.4% fall in gas supply to the sector in that time.[25]
Energy price hikes	Bangladesh significantly increased prices of various fuels and electricity from 2022 to 2025 amid global fossil fuel market volatility and growing subsidies in the power and energy

[22] Hydrocarbon Unit. Annual Report on Gas Production, Distribution and Consumption 2023-24. November 2024.
[23] The Business Standard. Industries Grappling with Persistent Gas Crisis. 1 December 2024.
[24] BBS. GDP of Bangladesh FY2020-21 to FY2023-24. 10 February 2025.
[25] Hydrocarbon Unit. Reports on Energy Scenario of Bangladesh 2020-21 to 2023-24. December 2021 to December 2024.

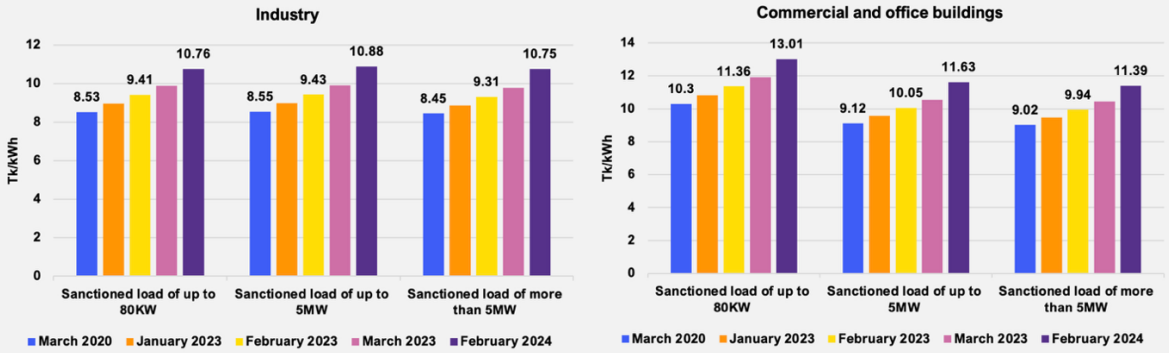
	sectors (see Box 1 for details of energy price hikes). With rising energy costs, the payback period of investment in energy efficiency falls. This makes it a lucrative investment for industries, and commercial and household entities.[26] Energy price hikes also encourage households, industries and businesses to conserve energy. The country's energy efficiency improved at a faster rate between 2021 and 2024, when the government drastically increased energy prices.
Emissions mitigation targets for the apparel industry and its competitiveness	Contributing more than 80% to Bangladesh's export earnings, the apparel sector is central to the country's economic development.[27] Due to enhanced global awareness of the sector's overall contribution to climate change, international buyers need to mitigate greenhouse gas (GHG) emissions from their value chains. As buyers' GHG emissions are mostly Scope 3, apparel manufacturers must undertake mitigation measures, and the industry has a target to reduce GHG emissions by 30% by 2030.[28] While renewable energy and energy efficiency are fundamental tenets of minimising carbon footprint, Bangladesh's on-grid share of clean energy is limited. As a result, the apparel sector is ramping up energy-efficiency and conservation measures to reduce GHG emissions. Besides, the sector pursues energy efficiency to limit production costs and remain competitive in the global market.
Growing awareness	With shrinking local gas supply and rising import dependence, SREDA undertook a series of measures, including national events and targeted messaging, to raise awareness of energy efficiency and conservation. A notable shift to energy-efficient light-emitting diode (LED) lights from compact fluorescent lamps (CFLs) and incandescent lamps in the household, commercial, and industry sectors is an example of awareness-driven energy efficiency measures. Further, awareness induces behavioural change to limit wasteful energy consumption.
Capacity development and certification	SREDA and international agencies developed the capacity of industries and financial institutions on technical and financial perspectives of energy efficiency, contributing to the implementation of projects. SREDA's certification of energy auditors and managers is making qualified professionals available for energy efficiency projects in large energy-consuming entities.
Low-cost Finance	Affordable funding from the Bangladesh Bank, development agencies, and the Green Climate Fund encourage industries to commit to energy efficiency.[29,30,31&32] On the other hand, new market entrants, such as industries, with support from the Bangladesh Bank, consider setting up green buildings with passive design features and state of the art technologies to reduce energy consumption.

[26] IEEFA. Revised Tariffs Make Energy Efficiency Compelling for Bangladesh. 22 April 2024.
[27] IEEFA. Industrial Energy Efficiency Offers a Multitude of Benefits to Bangladesh. 6 June 2023.
[28] Bangladesh Garments Manufacturers and Exporters Association. Environment. November 2025.
[29] Bangladesh Bank. Quarterly Review Report on Sustainable Finance of Banks and Finance Companies January-March 2025. 2025.
[30] Bangladesh Infrastructure Finance Fund Limited. Energy Efficiency and Conservation Promotion Financing Project. 2016.
[31] Bangladesh Bank. Loan Fund for Pre-finance Programme to Support Safety Retrofits and Environmental Upgrades in the Bangladeshi Ready-Made Garments (RMG) Sector Project (SREUP) (BD-2230322). 31 March 2019.
[32] The Daily Star. IDCOL Signs Deal with GCF to Receive $256.5 Million for private Sector Investment. 20 July 2022.

Box 1: Energy price hikes in quick succession

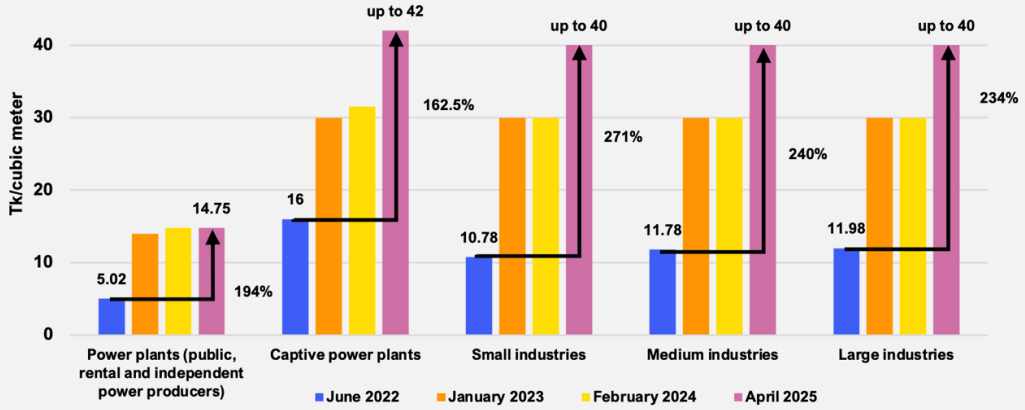
The Bangladesh government drastically increased the prices of fuel oils in August 2022. For instance, it raised the price of diesel from Tk80/litre to Tk114/litre, a 42.5% hike.[33] Besides, industries, commercial entities, offices and households experienced up to a 27.5% increase in power tariffs between January 2023 and February 2024 (Figure 5).[34,35] Furthermore, the government raised gas tariffs three times between January 2023 and April 2025, increasing costs in different sectors between 162.5% and 271%.[36,37,38&39] For example, the cost of gas soared in public, rental and independent power plants by 194%, from Tk5.02/m^3 to Tk14.75/m^3 (Figure 6).

Figure 5: Rising energy prices in industry and commercial and office buildings



Sources: Bangladesh Government Gazettes; IEEFA.
Note: Flat tariffs are included for industry and commercial/office buildings

Figure 6: Rising gas tariffs for selected consumer groups



Sources: Bangladesh Government's Gazettes; IEEFA; Notes: For captive power plants and industries, tariffs are "up to" that amount. For example, captive power plants seeking approval for a gas connection will pay Tk42/m^3 of gas, whereas existing plants will pay Tk31.5/m^3 for consuming gas within the sanctioned load. For gas consumption beyond the sanctioned load, existing plants will pay Tk42/m^3 of gas consumption. For approved/promised captive power plants, the tariff is Tk31.5/m^3 for consumption of up to 50% of the sanctioned load. Beyond that it is Tk42/m^3 of gas.

[33] The Daily Star. Record Hike in Gas Prices. 6 August 2022.
[34] Bangladesh Energy Regulatory Commission (BERC). Gazette on Retail Electricity Tariffs. 27 February 2020.
[35] Ministry of Power, Energy and Mineral Resources (MPEMR). Gazettes on Retail Electricity Tariffs January 2023 – February 2024. January 2023 – February 2024.
[36] BERC. Prices of Gas at Consumer Level. 4 June 2022.
[37] MPEMR. Gazette on Gas Prices for Consumers of Different Distribution Companies under Bangladesh Oil, Gas and Mineral Corporation (Petrobangla). 18 January 2023.
[38] MPEMR. Gazette on Gas Prices for Power Plants and Captive Power Plants. 25 February 2024.
[39] BERC. Gas Prices for New, Promised and Existing Industries and Captive Power Plants (including the consumption within and beyond sanctioned loads). 13 April 2025.

Energy efficiency trends vs 2030 and 2035 targets

Bangladesh has two energy efficiency targets. First, it requires improving 20% energy efficiency by 2030 compared with FY2014-15 levels as per the Energy Efficiency and Conservation Master Plan. Further, the country should enhance energy efficiency by 19.2% by 2035 compared with 2022 levels based on its NDC 3.0 (Table 1).

For the 2030 goal, Bangladesh should reach an energy intensity of 1.23 kg oil equivalent (kgoe)/Tk1,000 of GDP by 2030, against 1.54kgoe/Tk1,000 of GDP in FY2014-15.[40] The country registered an average annual energy efficiency improvement of 1.52% between FY2014-15 and FY2023-24.[41] At that rate, the country will reach the 2030 goal a year early.[42]

In addition, Bangladesh recorded an energy intensity of 1.41kgoe/Tk1,000 of GDP in FY2021-22 (see Figure 2). It should reduce the energy intensity to 1.14kgoe/Tk1,000 of GDP by 2035 to hit the goal of 19.2% efficiency improvement.[43] With the average annual efficiency improvement rate of 1.52%, it will also reach the 2035 goal a year early.[44]

Priority areas for energy efficiency gains

Despite almost a decade of progress, energy efficiency still offers significant untapped opportunities for Bangladesh. This section provides an overview of the priority sectors for the country to enhance energy efficiency, based on relevance and demand growth pattern. For instance, households and industry will remain key sectors on the demand side, as they, combined, are responsible for more than two-thirds of the final energy consumption.[45] Besides, the country should target commercial buildings to ramp up energy efficiency.

Households

With the increasing global mean temperature, the demand for cooling is drastically increasing in Bangladesh. Besides, rising disposable income and aspirations are likely to increase the adoption of

[40] Energy intensity in FY2014-15: 1.54kgoe/Tk1,000 of GDP (see Figure 2); Energy intensity to achieve 20% energy efficiency: (1.54 * (1-20%)) = 1.23kgoe/Tk1,000 of GDP.
[41] Average energy efficiency improvement rate between FY2014-15 and FY2023-24: 13.64%/9 = 1.52% a year.
[42] Energy intensity in FY2023-24: 1.33kgoe/Tk1,000 of GDP; With efficiency improvement of 1.52% a year, energy intensity in FY2028-29: 1.33*(1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) = 1.23kgoe/Tk1,000 of GDP. This shows that Bangladesh will attain its 2030 goal a year early.
[43] Energy intensity in FY2021-22: 1.41kgoe/Tk1,000 of GDP. Energy intensity to achieve 19.2% energy efficiency: (1.41 * (1-19.2%)) = 1.14kgoe/Tk1,000 of GDP.
[44] Energy intensity in FY2023-24: 1.33kgoe/Tk1,000 of GDP; With annual efficiency gains of 1.52%, energy intensity in FY2033-34: 1.33 * (1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) * (1-1.52%) *(1-1.52%) = 1.14kgoe/Tk1,000 of GDP. This substantiates that Bangladesh will likely achieve its 2035 energy efficiency goal a year early.
[45] IEEFA's estimate is based on Bangladesh's Integrated Energy and Power Master Plan (IEPMP) 2023.

new appliances, leading to a surge in household energy consumption. Between FY2014-15 and FY2023-24, household electricity consumption surged 2.4-fold in Bangladesh.[46]

Therefore, the household sector will provide a crucial window of opportunity in the next decade. Notably, many households have already replaced incandescent and fluorescent lights with LEDs, and are increasingly adopting efficient air conditioners.[47,48] In addition, SREDA should raise awareness that investing in efficient appliances pays off, with targeted events to motivate households reluctant to adopt efficient appliances.

With increasing adoption of efficient appliances, Bangladesh must set minimum energy performance standards (MEPs) for appliances and energy-efficiency labels. This will help household consumers select the most efficient appliances, and contribute to the country's energy efficiency goals.

Besides, the country should enforce its national building code, which provides the regulatory base for passive design while incorporating energy-efficiency features in new establishments to reduce energy demand (for example, lower cooling demand).

Bangladesh may also establish a super energy service company (ESCO), backed by the government, similar to India's Energy Efficiency Services Limited, to expedite energy efficiency in the household sector. A super ESCO could assess energy-efficiency potential in households, make investments, monitor energy efficiency improvement and recover the upfront investments from energy savings.

Moreover, high import duties on efficient appliance components raise upfront costs, resulting in affordability concerns. The National Board of Revenue (NBR) should rationalise import duties to support the government's initiatives to improve energy efficiency (Box 2).

Industry

For almost a decade, most industries have harnessed the low-hanging fruit, such as LED lights, to reduce energy consumption. Once the standards of LED lights are fixed, industries will maximise the energy savings through lighting efficiency improvements.

Besides, many industries have improved boiler efficiency, reduced losses through leakages, recovered waste heat from captive generators, and embraced technologies like vertical roller mills and efficient furnaces. Yet, industry still offers significant untapped energy-efficiency opportunities (Table 3).

[46] BPDB. Annual Reports 2014-15 to 2023-24. August 2015 to October 2024.
[47] Dhaka Tribune. Govt Preparing for Star Labelling in LED Bulbs. 6 April 2024.
[48] The Daily Star. Chilling the Heat: Inside Bangladesh's Booming AC Market. 26 June 2025.

Table 3: Industrial energy efficiency interventions with high potential

Technical interventions	Rationale
Motors and motor-driven systems (pumps, compressors)—installing efficient motors (IE3, IE4) and using variable frequency drives (VFDs)	Motors and motor-driven systems consume almost two-thirds of the electrical energy used in industry.[49] Efficient motors along with VFDs could drastically reduce industrial electricity consumption compared with the business-as-usual scenario.
Replace inefficient gas boilers with electric boilers	Boilers consume most of the gas used in industrial processes (excluding captive power generation).[50] A transition from gas boilers (average efficiency ~70%) to electric boilers (nearly 100% efficient at point of use) can slash gas consumption.[51,52] This would increase the utilisation of grid-based power, and thus minimise capacity charges for plants operating at lower load factors.
Energy-efficiency improvement in captive power generation	Despite efficiency gains in captive power generation, about half of industries do not operate efficient generators and utilise waste heat in industrial processes. This could save Bangladesh 50.18 billion cubic feet (Bcf) of LNG imports a year.[53]

On the implementation side, SREDA should expand the number of large energy consumers from 189, of which 90% are industrial. Setting annual energy savings targets for them to rapidly scale up energy efficiency would set examples for other industries to follow.

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Furthermore, Bangladesh should enforce the minimum energy efficiency standards for captive power generation, fixed by SREDA, to limit the waste of gas.[54]

As low-cost finance is crucial, the Bangladesh Bank should continue the existing green funds for accelerated implementation of industrial energy efficiency projects. The Bangladesh Bank may consider designing an energy efficiency financing scheme, supported by multilateral development banks, and simplify the fund access modality. The establishment of a super ESCO could help catalyse increasing investment in industrial energy efficiency and mitigate risks.

Alongside these measures, SREDA should engage with the NBR to rationalise import duties on energy efficient appliance components to reduce the upfront cost (Box 2).

[49] World Bank. Demand-side Energy Efficiency Opportunities in Bangladesh. Page 65. 2017.
[50] Ibid. Page 16.
[51] Ibid. Page 17.
[52] Agora Industry. Power-2-Heat: Gas Savings and Emissions Reduction in Industry. Page 17. November 2022.
[53] IEEFA. Industrial Energy Efficiency to Curb Bangladesh's Short-term LNG Demand Growth. May 2024.
[54] SREDA. Energy Management Guideline for Gas Engine Co-Generation Systems. April 2025.

Commercial

While aggregate energy consumption in the commercial sector is much less than both household and industry, energy efficiency improvement in the sector is crucial due to its high air conditioning demand. With soaring temperatures during the summer, the air conditioning load will increase in this sector. Although the sector is embracing efficient air conditioners, fixing the MEPs and efficiency labels of the appliance is imperative to ensure optimal energy efficiency. Once SREDA fixes the standards of LED bulbs, the sector will also achieve the desired efficiency in lighting.

The adoption of passive design will likely reduce the cooling demand in the sector's new buildings.

As the large energy consumer base consists of only nine commercial buildings, including hotels and shopping malls, SREDA should raise the number of commercial entities and fix a periodic energy savings target for them.

Energy efficiency improvement may significantly hinge on the affordability of efficient appliances, which requires SREDA's involvement to minimise high import duties (Box 2).

Box 2: High import duties on components of energy efficient appliances

LED lights: In FY2025-26, the Bangladesh government increased customs duties on four key components of LED lights from 10% to 25%, raising the overall duties from 37% to 62%.[55,56&57] The increased costs may prompt price-sensitive household energy consumers to rely on cheap, poor-quality LED lights.

Compressors with inverters: These are used in air conditioning and refrigeration systems to adjust the motor's speed to the cooling demand, increasing energy efficiency. In FY2024-25, the Bangladesh government incorporated minimum import duties for compressors, and put a higher minimum duty on imported compressors with inverters compared with those without inverters.[58] This makes efficient air conditioners costlier, which may affect their uptake.

SREDA and the NBR should discuss the net positive impacts of energy savings over the lifecycle of an appliance compared with the one-off high import duty.

The way forward

Bangladesh made remarkable progress in enhancing energy efficiency between FY2014-15 and FY2023-24. Building on this momentum, it must further strengthen its energy efficiency to achieve its 2030 and 2035 goals. With rising energy import bills and growing concern for energy sustainability,

[55] Ministry of Finance. National Budget Speech 2025-26. Pages 53 and 70. 2 June 2025.
[56] Bangladesh Customs. Bangladesh National Tariff FY2025-26. Page 210. 29 July 2025.
[57] National Board of Revenue. National Customs Tariff FY2024-25. Page 160. 2024.
[58] Ministry of Finance. National Budget Speech 2024-25. Page 185. 6 June 2024.

Bangladesh must pursue measures to transform energy-consuming sectors into highly efficient ones while developing an energy-conscious society.

This study lays down stepping stones, spanning immediate as well as short- to medium-term measures, to enable Bangladesh to accomplish greater energy efficiency in the foreseeable future (Table 4).

Table 4: Steps to improve Bangladesh's energy efficiency ecosystem

Level 1: Encourage and demonstrate energy efficiency
• Arrange periodic awareness-raising events (campaigns) on energy efficiency for all stakeholders. • Organise technical sessions to demonstrate successful industrial energy efficiency cases, accompanied by visits to selected industries. • Conduct information events for industries and technology providers, supported by the Bangladesh Bank, to share features of available low-cost green funds for energy efficiency to address information asymmetry.
Level 2: Policy and regulation
Policy alignment and coherence • Align the base year and targets of the Energy Efficiency and Conservation Master Plan with NDC 3.0. • Reduce import duties on components of energy efficient appliances to make them affordable.
Energy efficiency standards and labelling regulations Expedite fixing energy efficiency labels for appliances such as lights, fans, and air conditioners, based on minimum energy performance standards (MEPs) to help consumers select efficient ones.
Large energy consumer base • Expand the large energy consumer base from 189. This will require increasing the number of certified energy auditors and managers. • Fix energy savings targets for large energy consumers.
Enforcement and monitoring *Immediate term* • Monitor the status of mandatory energy auditing and review audit reports of large energy consumers • Track the energy efficiency of industrial captive power generators, and ensure industries follow the benchmark for captive generators. • Enforce the National Building Code to encourage passive design to reduce cooling demand and enhance energy efficiency in the new buildings. *Short to medium term* • Develop a monitoring mechanism to phase out non-labelled appliances from the market once SREDA finalises energy efficiency labels. • Establish a framework to track the progress of energy efficiency in large energy consumers once SREDA fixes their targets.
Level 3: Low-cost finance
Ensure the availability and accessibility of Bangladesh Bank's low-cost finance for the installation of large-scale, capital-intensive machinery in industries. Besides, the Bangladesh Bank may explore the possibility of establishing an industrial energy efficiency finance facility supported by MDBs.

Level 4: Formation of a super Energy Service Company
Establish a super Energy Service Company (ESCO), akin to India's Energy Efficiency Services Limited, backed by the Bangladesh government, to drive energy efficiency both in household, industry, and commercial sectors. The super ESCO's role spans assessing energy efficiency potential to implementing projects under suitable business models, sharing risks and monitoring energy savings.

While dollar-denominated fossil fuel dependence shows no signs of slowing, Bangladesh should ensure energy efficiency remains a priority to flatten its demand curve and rein in its import bills.

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Annexure 1: Assessing energy efficiency improvement

Formula used:

Total energy efficiency improvement (TEEI) = $(EI_{yb} - EI_{yf})*100\%/EI_{yb}$ …… (i)

EI_{yb} = Energy intensity in the base year
EI_{yf} = Energy intensity in the final year

EI_{yb} = Total primary energy consumption in base year/gross domestic product (GDP) in base year
EI_{yf} = Total primary energy consumption in final year/GDP in final year

Average energy efficiency improvement per year = $TEEI/(Y_f - Y_b)$ …….. (ii)

Y_f = Final year

Y_b = Baseline year

Sample energy intensity calculation			
Fiscal year	**Primary energy consumption (million tonnes of oil equivalent (Mtoe))**[59]	**GDP (million taka (Tk))**[60]	**Energy intensity ((kg oil equivalent (kgoe)/Tk1,000 GDP))**
2023-24	44.45[61]	33,460,178[62]	1.33

Bangladesh's TEEI between FY2014-15 and FY2023-24 = 13.64%

Average energy efficiency improvement per year = 13.64%/9

= ~1.52%

[59] Hydrocarbon Unit. Energy Scenario of Bangladesh 2023-24. Page 7. December 2024.
[60] BBS. Gross Domestic Product of Bangladesh 2023-24. Table 4. Page 7. 10 February 2025.
[61] Biomass is excluded.
[62] GDP at constant prices is considered.

Annexure 2: Population data used for per capita GDP and primary energy consumption

Fiscal year	Population[63]
FY2014-15	159,383,179
FY2015-16	160,811,932
……..	……..
FY2023-24	173,562,364

Annexure 3: Cost savings from energy efficiency

Actual primary energy consumption in FY2023-24 = 44.45Mtoe[64]
Business-as-usual primary energy consumption in FY2023-24 (without energy efficiency gain)
= 44.45/(1-0.1364)
= 51.47Mtoe
Note: energy efficiency gain between FY2014-15 and FY2023-24 was 13.64%.

Primary energy savings in FY2023-24 due to energy efficiency
= (51.47 – 44.45) Mtoe
= 7.02 Mtoe

Assumption to meet additional fuel demand (7.02Mtoe) without energy efficiency gain:
We assume equal shares (2.34Mtoe) of coal, LNG and oil in additional imports under the business-as-usual scenario due to infrastructure limitations. For instance, Bangladesh imported 247.58Bcf of LNG in FY2023-24. Additional LNG imports of 2.34Mtoe of LNG (equivalent to 101Bcf of LNG) will result in the utilisation of regasification capacity by about 91%.[65,66,67,68] Therefore, importing LNG beyond this capacity is difficult. Similarly, existing oil storage capacity would limit a massive surge in oil consumption. Furthermore, meeting the excess demand (7.02Mtoe) by running coal-fired plants is not a realistic proposition as industries rely on gas for both thermal and electrical energy. The installed capacity of coal-fired plants in FY2023-24 also would not be able to meet such demand.

Therefore, to meet additional demand, we assume a combination of fuels as below:
i. **Additional coal import** = 2.34Mtoe
= 3.7 million tonnes[69]

[63] World Bank. Bangladesh. 25 November 2025.
[64] Hydrocarbon Unit. Energy Scenario of Bangladesh 2023-24. Page 7. December 2024.
[65] The Bangladesh government approved the expansion of regasification capacity in October 2023.
[66] The Daily Star. Govt to Buy LNG from Excelerate under 15-year Pact. 26 October 2023.
[67] IEEFA. Industrial Energy Efficiency to Curb Bangladesh's Short-term LNG Demand Growth. 13 May 2024.
[68] Total LNG import including additional capacity: 247.58 + 101 = 348.58Bcf; Utilisation of regasification capacity: 348.58/((365+401.5)/2) = 90.9% ~91%
[69] Based on the conversion factor used by the Hydrocarbon Unit. Page 7.

ii. **Additional LNG import** = 2.34Mtoe
= ~101 billion cubic feet (Bcf)[70]
= 97,566,000 million metric British Thermal Units (MMBtu)[71]
= ~97.566 million MMBtu
= 97.6 million MMBtu

iii. **Additional oil import** = 2.34Mtoe
= ~2.34 million tonnes[72]

Average import price of different fuels in FY2023-24 (conservative approach)

i. **Imported coal price**: USD120/tonne[73,74]
ii. **Imported oil price**: We take the average of diesel oil, crude oil and furnace oil prices
  a. Price of diesel oil: USD1,040/tonne[75,76]
  b. Price of furnace oil: USD552/tonne[77]
  c. Price of crude oil: USD85/barrel[78,79] = USD623/tonne[80]

Therefore, imported oil price is: USD738/tonne.

iii. **Imported LNG price**: We use average long-term sample prices and consider shipping and other costs. We further consider Brent crude oil price as USD85/barrel (see above).
$\text{LNG price}_{\text{Qatar}}$ = (12.65% of three-month average price of Brent crude oil/barrel + USD0.5/MMBtu)
= (12.65%*USD85 + USD0.5)/MMBtu = USD11.25/MMBtu

$\text{LNG price}_{\text{Excelerate}}$ = (13.35% of Brent crude oil/barrel on the day + USD0.3/MMBtu)[81]
= (13.35%*USD85 + USD0.3)/MMBtu = USD11.65/MMBtu

$\text{LNG price}_{\text{RasGas}}$ = (12.65% of three-month average price of Brent crude oil/barrel + USD0.5/MMBtu)[82]
= (12.65%*USD85 + USD0.5)/MMBtu = USD11.25/MMBtu

Therefore, the LNG import price is: USD12/MMBtu.[83]

[70] Based on the conversion factor used by the Hydrocarbon Unit. Page 7.
[71] BP. Approximate Conversion Factors – Statistical Review of World Energy. Page 2. July 2021.
[72] Based on the conversion factor used by the Hydrocarbon Unit. Page 7.
[73] JWC Indonesia Energi. Indonesia Coal Price Index. October 2025.
[74] ICI 2 coal is considered and approximately 30% price is added to cover insurance, shipping and other costs.
[75] Bangladesh Petroleum Corporation. Price of Petroleum Products. October 2025.
[76] Prices are comparable to FY2023-24.
[77] Ibid.
[78] Investing.com. Brent Oil Futures Historical Data July 2023 – June 2024. 2025.
[79] The average import price of brent crude oil is USD84.3/barrel considering the average price of five days per month during FY2023-24. As there is a shipping cost, the price is considered USD85/barrel.
[80] Based on the conversion factor used by BP. Page 1.
[81] The Daily Star. Govt to Buy LNG from Excelerate under 15-year Contract. 26 October 2023.
[82] The Financial Express. BD Eyes 24 Cargoes from Spot Market in 2024. 27 December 2023.
[83] Taking the average of three prices and adding approximately USD0.62/MMBtu for shipping and other costs.

Approximate cost savings in FY2023-24 = avoided cost of fuel imports
= 3.7 million tonnes of coal * USD120/tonne + 97.6 million MMBtu of LNG * USD12/MMBtu of LNG + 2.34 million tonnes of oil * USD738/tonne of oil
= USD444 million + USD1,171.2 million + USD1,726.92
= USD3,342.12 million
= USD3.342 billion
= ~USD3.34 billion

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About the Author

Shafiqul Alam

Shafiqul Alam is a lead energy analyst at IEEFA. He has 15 years' experience in the energy and climate change sectors. His interest primarily centres on renewable energy, energy efficiency, climate finance, and policy instruments to spearhead the clean energy transition. He is an engineer with an MBA and a master's degree in environmental economics. He is an international climate protection fellow of the Alexander von Humboldt Foundation, Germany, and a clean energy fellow of the National Bureau of Asian Research, USA. salam@ieefa.org

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