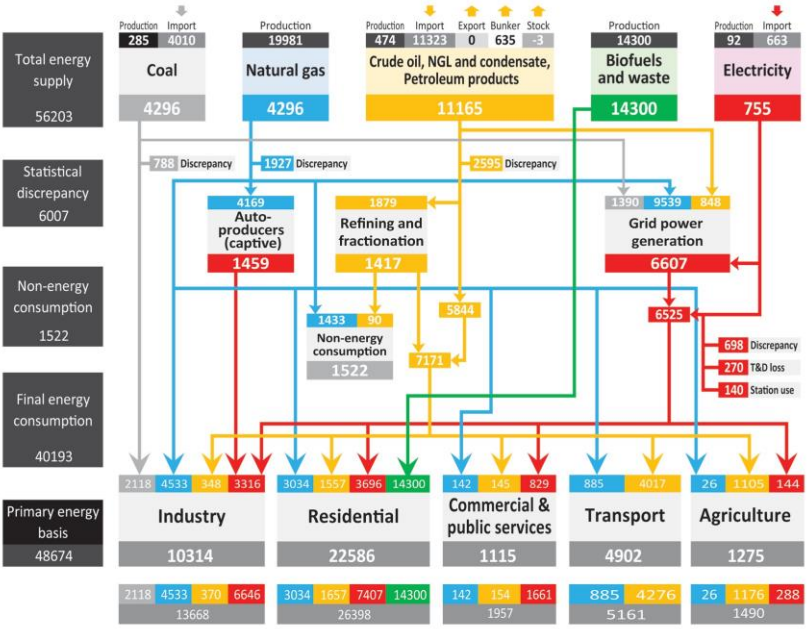
SREDA
Sustainable and Renewable Energy Development Authority

National Energy Balance 2021-22

(Improvement of Energy Efficiency and Conservation)

National Energy Balance Flow Figure (FY2021-22) in ktoe:



Note: Petroleum product input to grid power generation is assumed to be imported.
Auto-producer (captive) power generation net efficiency is assumed to be 35%

April 2024

Sustainable and Renewable Energy Development Authority (SREDA)
Power Division
Government of the People's Republic of Bangladesh

National Energy Balance 2021-22
(Energy Efficiency Improvement)

Table of Contents

Part I Energy Supply and Demand Trend

Part II Energy Balance and Intensity

Part III Energy Balance Statistics

Part IV National Energy Security and Emission Reduction

Acronyms

AC	Air Conditioner
A/C	Alternate current
ADB	Asian Development Bank
AFD	Agence française de développement
BAB	Bangladesh Accreditation Board
BAU	Business as usual
BBS	Bangladesh Board of Statistics
BCMCL	Barapukuria Coal Mining Company Limited
BDT	Bangladesh Taka (currency unit)
BEEER	Building Energy Efficiency and Environment Rating
BEMS	Building Energy Management System
BERC	Bangladesh Energy Regulatory Commission
BIFFL	Bangladesh Infrastructure Finance Fund Limited
BPC	Bangladesh Petroleum Corporation
BPDB	Bangladesh Power Development Corporation
BRESL	Barrier Removal and Cost-Effective Efficiency Standards and Labelling
BUET	Bangladesh University of Engineering and Technology
CHT	Chattogram Hill Tracts
CO_2	Carbon dioxide
COP	Conference of the Parties (UNFCCC)
EA	Energy Auditor
EACE	Energy Auditor Certification Examination
EAF	Energy Audit firm
EE&C	Energy Efficiency & Conservation
EECMP	Energy Efficiency Master Plan up to 2030
EECPF	Energy Efficiency & Conservation Promotion Financing
EECPFP	EE&C Promotion Financing Project
EM	Energy Manager
EMRD	Energy & Mineral Resourced Division
ERL	Eastern Refinery Limited
ESCO	Energy Service Company
FEC	Final energy consumption
FY	Fiscal year
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas

GW	Gigawatt (power generation capacity unit)
HCU	Hydrocarbon Unit
ICS	Improved Cooking Stove
IDCOL	Infrastructure Development Company Limited
IFI	Implementing Financial Institution
IRPS	Improved Rice Parboiling System
JICA	Japan International Cooperation Agency
JPY	Japanese Yen (currency unit)
KfW	KfW Entwicklungsbank, KfW Group
Ktoe	Kilo ton oil equivalent (calorific unit)
kW	Kilowatt
kWh	Kilowatt hour
L/C	Letter of credit
LDC	Least Developed Country
LED	Light emitting diode
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MCPP	Mujib Climate Prosperity Plan
MIS	Management information system
MP	Master Plan
MPEMR	Ministry of Power, Energy and Mineral Resources
Mtoe	Million-ton oil equivalent (calorific unit)
MWh	Megawatt hour (calorific unit)
NDC	Nationally determined contribution
NOC	No objection certificate
PES	Primary energy supply
RE	Renewable energy
RMG	Ready-made garment
RPGCL	Rupantarita Prakritik Gas Company Limited
SDGs	Sustainable Development Goals
SHS	Solar Home System
SREDA	Sustainable and Renewable Energy Development Authority
T/A	Technical assistance
TFEC	Total final energy consumption
toe	Ton oil equivalent
TPES	Total primary energy supply
TV	Television
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

Part I Energy Supply and Demand Trend

(The page is left intentionally blank)

1.1 Introduction

Bangladesh celebrated its 50th anniversary amidst a remarkable economic trajectory, sustaining over 6% growth for a decade, with ambitions to transition into a middle-income nation. However, this growth has paralleled an increase in energy consumption while the availability of its primary energy source like natural gas has dwindled. To ensure the continuity of its economic progress, the Government of Bangladesh enacted the Sustainable and Renewable Energy Development Authority (SREDA) Act in 2012. This legislation established SREDA as the designated authority responsible for promoting the sustainable production and utilization of energy. SREDA officially commenced operations on May 22, 2014, focusing on accelerating the deployment of renewable energy sources and advocating for energy efficiency and conservation measures. .

This booklet, created and released by SREDA, contains information on the national energy balance data for the 2021–22 fiscal year (July 2021–June 2022). It includes studies and trends related to supply-demand balance and demand-side energy use. The energy supply and demand trend, energy balance and intensity, energy balance statistics, and national energy security and emission reduction make up its four sections. The following governmental organization provided the datasets used in the publication:

- Bangladesh Bureau of Statistics (BBS)
- Hydro Carbon Unit (HCU) of the Energy and Mineral Resources Division (EMRD)
- Bangladesh Petroleum Corporation (BPC)
- Bangladesh Oil, Gas & Mineral Corporation (Petrobangla)
- Eastern Refinery Limited (ERL)
- Barapukuria Coal Mining Company Limited (BCMCL)

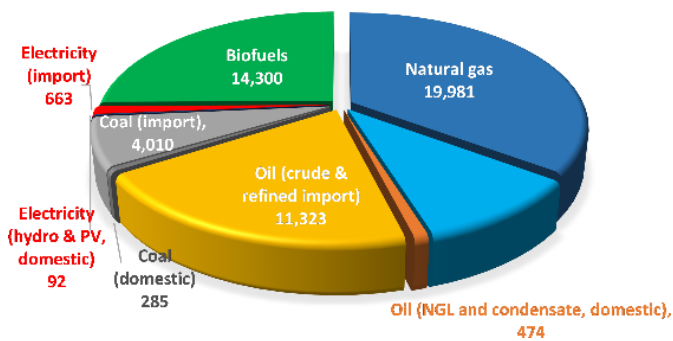
- Rupantarita Prakritik Gas Company Limited (RPGCL) and
- Bangladesh Power Development Board (BPDB)

With the exception of biomass and aviation bunker, all of the nation's energy supply and demand is covered by these figures, which may provide an indication of the general trend. When these data are available from credible sources, they will be included in later editions of the Energy Balance handbook. The information utilized by fiscal year is shown below.

Primary Energy	Year of data
Natural Gas (domestic)	2021-22
Natural Gas (imported)	2021-22
Oil (refined & crude import)	2021-22
Coal (imported)	2021-22
Coal (local)	2021-22
Biofuel & waste	2021-22
Electricity (PV& hydro)	2021-22
Electricity (imported)	2021-22
Any other source of energy	
Bunker Fuel export	Not considered

1.2 Primary Energy Supply by Fuel Source

The In FY 2021–22, Bangladesh's primary energy supply (PES) was 56.203 Mtoe. Natural gas that is produced locally accounts for one-third of the nation's supply. LNG (liquefied natural gas) imports began in FY2018–19 and are growing quickly. In its third fiscal year, the percentage of imported natural gas has already topped 21% of the total gas supply. Oil and its byproducts make up a significant amount of the energy supply. The percentage of domestically accessible supply for both coal and oil is low, with imports making up a sizable share of the supply. More than a quarter of the primary energy supply is made up of biofuels and wastes, primarily firewood used for home cooking in rural and some urban families.



Unit: ktoe

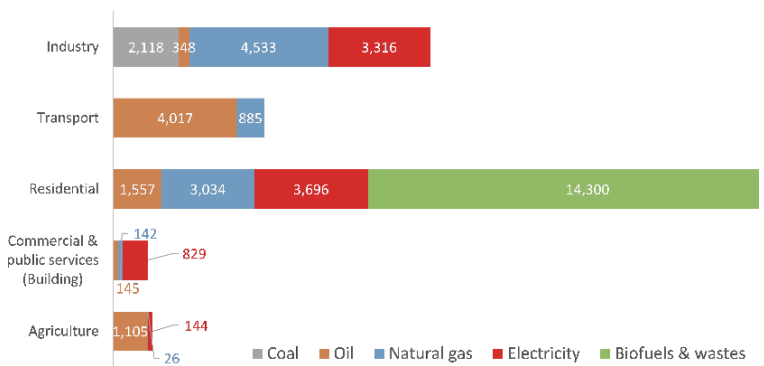
Note: Domestic sales data is used to represent supply, for natural gas and coal, instead of actual domestic production (or import) minus stock change and bunkers due to limited availability of published data.

Source: Compiled by SREDA from HCU, BPC, Petrobangla, ERL, BCMCL, RPGCL and BPDB data

Figure 1 Composition of Primary Energy Supply

1.3 Energy Consumption by Sector and Source

In the fiscal year 2021-22, total final energy consumption reached 40.193 million tons of oil equivalent (Mtoe), as reported by SREDA based on readily-available national data. Notably, the residential sector emerged as the predominant energy consumer, accounting for 22.586 Mtoe. Within this sector, biofuels, primarily in the form of firewood for cooking, constituted more than half of the consumption. In terms of electricity usage, the industrial sector surpassed all others, consuming 3.316 Mtoe. This sector heavily relies on fossil fuel-derived energy sources, namely natural gas, coal, and electricity. The transport sector accounted for 4.902 Mtoe of energy consumption, with petroleum products constituting 82.85% of this figure. Additionally, natural gas, particularly in the form of compressed natural gas (CNG) for motor vehicles, contributed to the remainder of the sector's energy usage.



Unit: ktoe

Note: * Commercial and public services (building) sector includes “commercial” and “others”.
Source: Compiled by SREDA from HCU, BPC, Petrobangla, ERL, BCMCL, RPGCL and BPDB data

Figure 2 Energy Consumption by Sector and Source

1.4 Energy Consumption on Primary Energy Basis

SREDA, tasked with promoting Energy Efficiency and Conservation (EE&C), conducts thorough analyses of demand-side energy consumption to pinpoint opportunities for energy savings, particularly aimed at reducing the reliance on fossil fuel-derived energy sources. To achieve a comprehensive understanding of current energy consumption patterns, it's crucial to compare energy consumption across various sectors and fuel sources on an equitable basis. This entails analyzing energy consumption on a primary energy basis, which refers to the calorific value of the original input required to make energy available, rather than simply comparing the consumed calorific value.

For instance, the calorific value of one Megawatt-hour (MWh) of electricity is 0.086 tons of oil equivalent (toe). However, when considering primary energy consumption for the fiscal year 2021-22, the final consumption of one MWh of electricity is calculated as 0.238 toe. This discrepancy arises because the primary energy basis figure for electricity accounts for the calorific amount of fuel needed to generate the electricity, factoring in operational efficiencies and losses. Specifically, based on data from the Bangladesh Power Development Board (BPDB) annual report for 2021-22, accounting for a net thermal power generation efficiency of 42.86% and an overall network loss of 10.41%, it is determined that 0.238 toe is required to generate one MWh of electricity on a calorific basis.

Similarly, for petroleum products, such as oil, the final consumption of one toe is calculated as 1.14 toe on the primary side. This calculation considers the overall efficiency of the oil refinery, estimated at 88%, as reported in the Eastern Refinery Limited (ERL) annual report.

Notably, loss and efficiency factors are not considered for natural gas consumption, hence the primary energy basis figure for natural gas consumption is deemed equivalent to the final consumption calorific value. This meticulous analysis allows for a more accurate assessment of energy consumption patterns and informs strategic initiatives aimed at enhancing energy efficiency and reducing reliance on fossil fuels. Conversions mentioned in the above explanations are presented in the table below.

Table 1: Conversion Factors Used for Primary Energy Basis Calculation

Item	Conversion	Remarks
Caloric value of 1 MWh of electricity	0.086 toe	At consumption side
Net Thermal power efficiency	40.07%	Includes power station own use losses.
Caloric value of 1 MWh of electricity (at Consumer/Distribution side)	0.238 toe	At primary fuel side
For electricity generation, 1 toe of equivalent electricity at consumer/distribution side	2.76 toe	At primary fuel side (40.07% efficiency)
1 toe of petroleum product at 88% efficiency as per ERL data	1.14 toe	Simple input – output comparison figure
Natural gas efficiency	100%	Loss related date are not considered

Total final energy consumption of 40.193 Mtoe. The breakdown by sector shows that industry sector comprises the dominant portion of energy consumption on primary energy basis, while the second dominant sector, the residential sector also takes up a significant portion.

Table 2: Energy Consumption by Sector and Source (Primary Energy Basis)

FY 2021-22	Industry	Transport	Residential	Commercial & public services (building)	Agriculture	Total
Gas	4533	885	3034	142	26	8620
Oil	348	4017	1557	145	1105	
Coal	2118	0	0	0	0	
Electricity	3316	0	3696	829	144	
Non-energy consumption	-	-	-	-	-	1522

Unit: ktoe

Note:

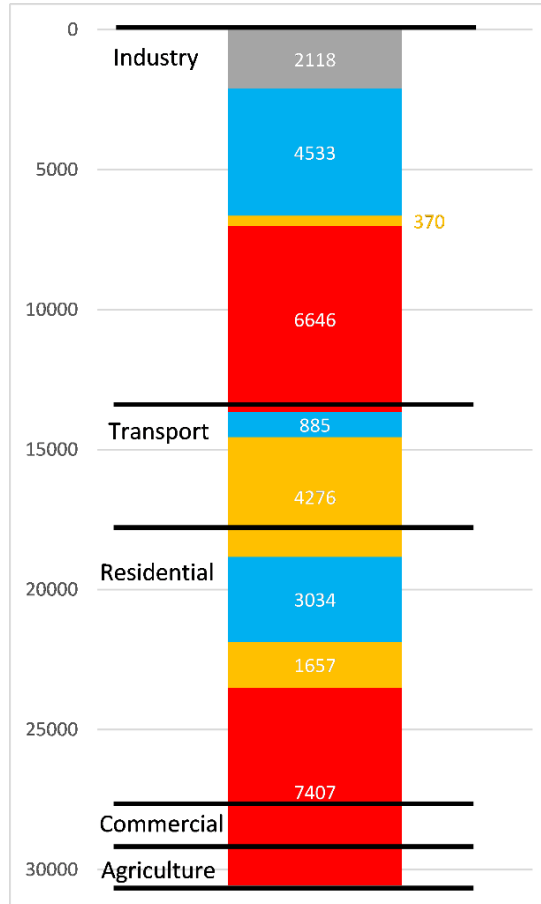
* Excludes biofuels and wastes.
* Commercial and public services (Building) sector is the compilation of “commercial” and “others”.
* Domestic sales data is used to represent supply, for natural gas and coal, instead of actual domestic production (or import) minus stock change and bunkers due to limited availability of published data.

Source: Compiled by SREDA from HCU, BPC, Petrobangla, ERL, BCMCL, RPGCL and BPDB data

Figure 3 on the subsequent page illustrates the breakdown of energy consumption by sector and energy source. Notably, electricity consumption, highlighted in red, particularly in the industrial and residential sectors, constitutes a significant portion of the country's total energy consumption. This highlights the considerable potential for energy savings in these sectors.

Drawing upon primary energy-based consumption data analysis, SREDA is adept at identifying these priority areas for promoting demand-side Energy Efficiency and Conservation (EE&C) initiatives. The ongoing Energy Efficiency & Conservation Promotion Financing Project (EECPFP), elaborated upon in Part IV of this publication, was established in response to insights gleaned from the analysis of primary energy-based consumption.

.



Unit: ktoe

Note:
* Excludes biofuels and wastes.
* Building sector is the compilation of "commercial" and "others".
Source: Calculated by SREDA from HCU, BPC, Petrobangla, ERL, BCMCL and BPDB data.

Figure 3 Energy Consumption (Primary Energy Basis) by Sector & Source

Carbon emission reduction is crucial for mitigating climate change, and a national energy balance table, utilizing primary energy-based conversion, facilitates a straightforward calculation of the country's carbon emissions by sector. Here, only CO2 emissions are considered among various greenhouse gases.

By identifying the primary energy-based fuel consumption for each sector, it becomes possible to calculate the overall carbon emissions of the country by sector. CO2 emission factors for natural gas, oil, and coal are sourced from the IPCC guidelines for greenhouse gas inventories. Additionally, the emission factor for grid electricity in Bangladesh is obtained from the ADB database.

It's worth noting that the emission factor for electricity already incorporates the primary consumption factor of electricity. To adjust for this, the emission factor of 6.14 t-CO2/toe should be divided by the primary consumption factor of electricity, which is 2.76, resulting in a revised emission factor of 2.22 t-CO2/toe. This meticulous approach ensures accuracy in assessing carbon emissions and informs targeted strategies for emission reduction.

The applied emission factors for each energy source are listed in the following table:

Table 3: CO2 Emission Factors

Energy source	Emission factor	
Natural gas	15.3 t-CO2/TJ	=> 0.64 t-CO2/toe
Oil	20.0 t-CO2/TJ	=> 0.84 t-CO2/toe
Coal	25.8 t-CO2/TJ	=> 1.08 t-CO2/toe
Electricity	0.648 t-CO2/MWh	=> 6.14 t-CO2/toe
	for primary energy basis calculation	=> 2.22 t-CO2/toe

Note: Converted to toe using 1 TJ = 23.88 toe, 1 MWh = 0.086 toe.
Electricity emission factor converted to primary energy basis calculation by dividingby 2.76, which is the primary consumption factor of electricity.

Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, IPCC, Volume 2:Energy, Chapter 1: Introduction, Table 1.4 for Natural gas, oil and coal.
ADB database. The IFI Dataset of Harmonized Grid Factors for electricity, 2021.

It was determined that the total CO2 emissions from fossil fuels during the fiscal year 2021–22 were 46545.48314kt-CO2. It is evident that of all the energy sources, electricity has the largest contribution. The breakdown of CO2 emission sources by sector reveals that the residential and industrial sectors account for a sizable share of emissions. Note that the CO2 emissions from the burning of fossil fuels are the focus of this chart, and the CO2 emissions from the consumption of biomass are not included.

Table 4: CO2 Emissions by Sector and Energy Source

FY 2021-22	Industry	Transport	Residential	Commercial & public services (building)	Agriculture	Total
Gas	2900.99671	566.561475	1941.58995	90.7528524	16.7455193	5516.64651
Oil	310.835837	3591.43682	1392.11600	129.317795	987.86566	6411.57212
Coal	2287.93952	0	0	0	0	2287.93952
Electricity	14754.7139	0	16295.4983	639.556351	639.556351	32329.3249
Total	20254.4860	4157.99829	19629.2042	859.626999	1644.16753	46545.4831

Unit: kt-CO2

1.5 Breakdown of Energy Consumption by Industry Sub-sector

As part of the preparation for the Energy Efficiency and Conservation (EE&C) Master Plan up to 2030, SREDA collaborated with various stakeholders in fiscal year 2013-14 to conduct a survey aimed at calculating the breakdown of energy consumption within industry sub-sectors. This calculation utilized panel data from major energy consumers, facilitated by cooperation with utility and energy distribution companies.

The survey findings revealed that the garment sector emerged as the largest energy-consuming sub-sector, accounting for 15.4% of the total energy usage within the industry sector. Following closely were the textile and chemical sub-sectors, each contributing approximately 12% to the total energy consumption within the industry sector.

It's important to note that the sub-sector breakdown calculation was carried out under limited data availability. Therefore, further research and data collection efforts will be necessary to obtain more accurate and updated data for informed decision-making and planning within the energy sector.

Table 5 National Energy Consumption by Industry Sub-sector (Primary Energy Basis)

Sub-Sector	Natural Gas	Electricity	Oil & Coal	Combined	Share
Garment	1,844	221	42	2,107	15.4%
Textile	1,586	92	17	1,695	12.4%
Chemical Fertilizer	1,554	94	18	1,666	12.2%
Chemical	282	29	5	316	2.3%
Steel & Re-rolling	276	230	143	649	4.7%
Cement	167	191	36	394	2.9%
Sanitary and Ceramics	152	50	9	211	1.5%
Pulp & Paper	124	22	4	150	1.1%
Glass	8	5	1	13	0.1%
Brick	0	6	1,277	1,284	9.4%
Food& Cold Storage	0	60	11	71	0.5%
Petroleum Refinery	0	1	0	1	0.0%
Sugar	0	1	0	2	0.0%
Jute Mills	0	59	11	71	0.5%
Others	2,134	2,463	465	5,062	37.0%
	8,125	3,524	2,042	13,691	100.0%

Source: SREDA, Energy Efficiency Master Plan up to 2030

(The page is left intentionally blank)

Part II National Energy Balance and Intensity

2.1 National Energy Balance Table

The national energy balance serves as a comprehensive presentation of energy data, depicting the overall pattern of energy supply, transformation, and consumption across major sectors and energy sources. It can be likened to an input-output data or a balance sheet table illustrating energy supply to consumption within the country.

In FY 2021-22, SREDA conducted an updated energy balance calculation based on readily-available national energy supply, transformation efficiency, and consumption data. Presented in Table 2 across the next two-page spread, this table provides a detailed overview of the country's energy balance. Figure 4 visually represents the flow of energy by sector and source based on this table.

It's important to note that the energy consumption in the national energy balance is on a final consumption basis, rather than a primary energy basis. Additionally, the table and visual presentation may contain ambiguity regarding the segregation of loss, stock change, and statistical discrepancies, necessitating data reconciliation once comprehensive data become available.

A notable characteristic of Bangladesh's national energy balance structure is the significant contribution of captive power generation. Approximately half of the natural gas is allocated to power generation, including captive power generation, with the latter playing a pivotal role in supplying electricity to the industry sector, accounting for around 40% of its supply.

National Energy Balance Table of Bangladesh

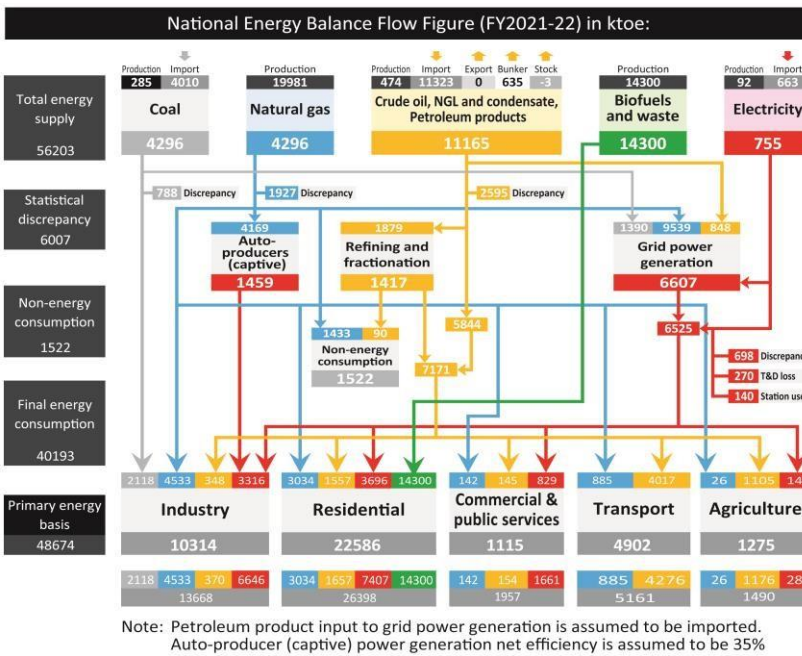
FY2021-22 (unit: ktoe)	Coal	Natural gas	Crude oil	NGL and condensate	Petroleum products	Biofuels and waste	PV and wind power	Hydro power	Electricity	Total
Production	285	19,981	0	474	0	14,300	28	64	0	35,132
Imports	**4,010**	**5,707**	**1,644**	**0**	**9,679**	**0**	**0**	**0**	**663**	**21,703**
Exports	0	0	0	0	0	0	0	0	0	0
Maritime & aviation bunkers	**0**	**0**	**0**	**0**	**635**	**0**	**0**	**0**	**0**	**635**
Stock change	-1	0	-3	0	0	0	0	0	0	-4
Others	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total energy supply	4,296	25,687	1,647	474	9,043	14,300	28	64	663	56,203
Statistical differences	788	1,927	242	0	2,352	0	0	0	698	6,007
Electric power plants	-1,390	-9,539	0	0	-848	0	0	0	6,607	-5,169
Auto-producers (captive)	**0**	**-4,169**	**0**	**0**	**0**	**0**	**0**	**0**	**1,459**	**-2,710**
Oil refineries	0	0	-1,405	0	1,227	0	0	0	0	-178
Condensate & NGL fractionation	**0**	**0**	**0**	**-474**	**190**	**0**	**0**	**0**	**0**	**-284**
Interproduct transfer	0	0	0	0	0	0	-28	-64	92	0
Industrial own use	**-0.44**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-139**	**-140**
Losses (T&D loss)	0	0	0	0	0	0	0	0	-270	-270
Final energy consumption	2,118	8,620	0	0	7,171	14,300	0	0	7,984	40,193
Industry	2,118	4,533	0	0	348	0	0	0	3,316	10,314
Transport	0	885	0	0	4,017	0	0	0	0	4,902
Residential	**0**	**3,034**	**0**	**0**	**1,557**	**14,300**	**0**	**0**	**3,696**	**22,586**
Commercial & public services	0	142	0	0	145	0	0	0	829	1,115
Agriculture	**0**	**26**	**0**	**0**	**1,105**	**0**	**0**	**0**	**144**	**1,275**
Non-energy consumption	0	1,433	0	0	90	0	0	0	0	1,522

Unit: ktoe

Source: Compiled from BBS, BPC, BCMCL, Petrobangla, BPDB, ERL, and HCU data

Table 6: National Energy Balance

When considering fuel sources for consumption, industry and residential sectors primarily use natural gas. It should be mentioned that a significant amount of the primary energy supply is made up of imported petroleum products and coal. The most common energy used in industry, homes, businesses, and public



Note: Petroleum product input to grid power generation is assumed to be imported.
Auto-producer (captive) power generation net efficiency is assumed to be 35%

services (building) sectors is electricity.

Note: Unit = ktoe

Seven boxes on the top (in five colours) are Primary Energy Supply by fuel source.
Middle **three** boxes (power plant, refinery, captive) are energy transformation means.
Bottom five boxes are final consumption by sector.

Source: Compiled from HCU, BPC, BCMCL, Petrobangla, ERL and BPDB data

Figure 4 National Energy Balance FY2021-22 (Visualized Flow)

The national energy balance's visual representation makes it easier to understand how energy moves across Bangladesh. The importance of natural gas should be mentioned first. It is evident that natural gas is used for power generation, both for grid and captive energy supply, as well as for use in industry and the residential sector. Over twenty percent of the electricity supplied is produced by captive sources. The fact that there are numerous routes for both supply and transformation further demonstrates the intricacy of oil flow.

2.2 National Energy Intensity

[1] Calculation

National energy intensity serves as a crucial indicator for monitoring Energy Efficiency and Conservation (EE&C) achievements within a country, particularly in dynamic economies like Bangladesh, where rapid economic growth is coupled with increasing energy consumption. This indicator considers both energy supply and economic growth, providing insight into the efficiency of energy usage relative to economic output. Lower national energy intensity indicates better performance in terms of energy efficiency.

Targets for EE&C promotion, outlined in the Energy Efficiency and Conservation Master Plan (EECMP), are set in terms of national energy intensity. The long-term objective aims to reduce national energy intensity by 20% compared to the baseline observed in fiscal year 2013-14. Initial calculations for this indicator were based on limited data availability, utilizing a combination of four datasets: domestic coal production, sales of petroleum products and natural gas, and imported electricity. From fiscal year 2018-19 onward,

calculations have transitioned to more comprehensive datasets, incorporating imports of coal and petroleum products. Additionally, the calorific values of natural gas have been updated to reflect officially available and updated data.

With this improved methodology, calculations can be backdated to fiscal year 2014-15, consequently shifting the baseline year for national energy intensity to FY 2014-15. Subsequent calculations extend through FY 2021-22, utilizing readily-available national energy datasets and economic data sourced from national accounts. The following table and chart present the calculation based on these datasets, providing a clear representation of national energy intensity trends.

.

Table 7: National Energy Intensity

Unit: ktoe	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Oil	6,729	6,796	6,486	8,429	7,107	8,413	9723	11165
Gas	23,104	25,491	26,028	25,916	27,494	26,273	26692	25687
Coal	1,617	2,887	2,318	2,722	4,019	4,661	4118	4296
Power from Hydro, Import and Solar	339	411	485	500	649	650	767	755
Primary Energy Supply	31,789	35,585	35,317	37,567	39,269	39,997	41300	41903
Real GDP in BDT billion	8,249	8,835	9,479	10,224	11,058	11,446	12,072	12929
Energy Intensity (TPES/GDP) ktoe / BDT billion	3.85	4.03	3.73	3.67	3.55	3.49	3.42	3.24
Trend	(base)	+4.5%	-3.3%	-4.7%	-7.9%	-9.3%	-11.2%	-15.9%

Note: The following major changes were made from FY 2018-19 issue:

(1) Imported coal and imported petroleum products data have been added.

(2) Production and import data combined are being used for natural gas supply.

Note: Biofuels and waste are excluded from the primary energy supply.

Note: Figures may not add up due to rounding.

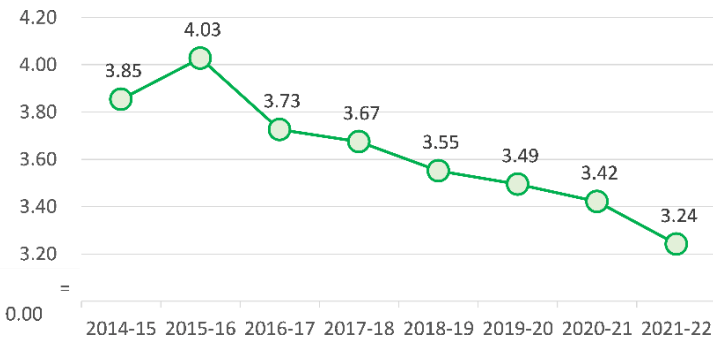
Source: SREDA compilation based on readily-available national energy data and national accounts.

[2] Trend

Figure obtained by dividing primary energy supply by the real GDP (constant 2010 price) is the energy intensity in the unit of ktoe / BDT billion. The latest national energy intensity for the FY 2021-22, in based on the new calculation was 3.24 ktoe / billion BDT, which is approximately 15.9% less than that of the shifted baseline year (FY 2014-15). It should be noted here that this achievement of 15.9% reduction also represents the effects of both the intended and non-intended energy efficiency promotion activities. Industries produce more with the same amount of energy consumption is deemed to be one of the major factors for achieving this EE&C improvement.

Unit: ktoe / BDT billion

Note: National Energy Intensity = PES / GDP



Note: Biofuels and waste are excluded from the primary energy supply.

Source: (1) PES: compilation from HCU (oil & petroleum, various import figures), BPC (Oil & Petroleum), BPDB (non-thermal power), Petrobangla (gas) andBCMCL (domestic coal) data.

(2) GDP (constant 2010): Bangladesh Bureau of Statistics

Figure 5 National Energy Intensity Trend

Bangladesh energy supply has significantly improved. But interrupted supply of energy hampers industrial production in Bangladesh. Bangladesh has prioritized to energy savings. Saved energy will contribute in minimizing carbon emission. A simple monetary conversion of the energy conservation which contributed to 15.9% improvement in energy intensity from FY 2014-15 to FY 2021-22 is done as follows: If the energy intensity in FY 2021-22 is assumed to be the same as that of FY 2014-15, the amount of energy required to achieve the actual economic production should have been 7873 ktoe more. Multiplying this virtually-saved energy with the common cost of crude oil (56928.23 taka per ton), the cost of saved energy, in conservative terms is calculated as approximately **BDT 448.2 billion**. Which indicate that more than 100 billion BDT saved byone year.

Table 8: Impact of National Energy Intensity Improvement

	FY 2014-15 GDP = 8,249 billion Taka	FY 2021-22 GDP = 12,929 billion Taka
National energy intensity = 3.85	Actual Energy supply = 31.8 Mtoe	Assumed situation Energy supply should be = 49.777 Mtoe *(7873 ktoe more than actual)*
National energy intensity = 3.24		Actual Energy supply = 41.903 Mtoe

There is a declining trend in national energy intensity, which means the country is producing more using the same amount of energy (or, same production is achieved with lesser energy). Background of this declining trend is the change in industrial structure, especially a shift towards service sector where energy consumption per production is lower compared with the industry sector.

[3] Analysis of the National Energy Intensity Trend

Apart from shifts in industrial structure, deliberate efforts have significantly contributed to the 15.9% improvement in national energy intensity in recent years. Primarily, upgrades in power generation, transmission, and distribution have enhanced energy conversion, transmission, and distribution efficiency, as evidenced by information from the Bangladesh Power Development Board (BPDB).

SREDA, with a mission to promote Renewable Energy (RE) and Energy Efficiency and Conservation (EE&C) on the demand side, has played a crucial role in alleviating national energy intensity through various initiatives. These include:

1. Financing programs to promote industrial energy efficiency.
2. Implementation of energy audit programs.
3. Preparation for an energy labeling program.
4. Energy Efficiency in Building Program.
5. Awareness-raising campaigns.

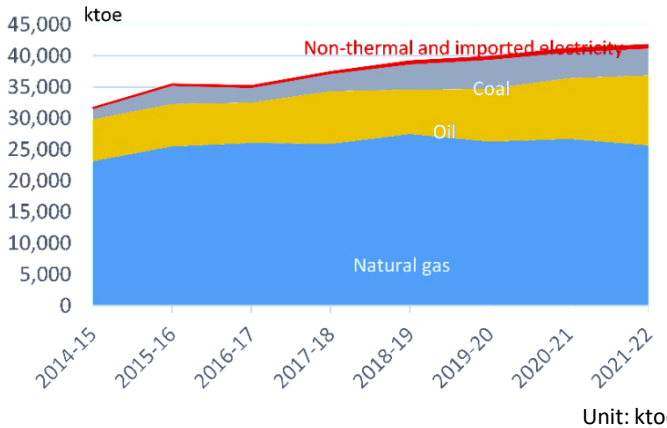
These activities are prominently featured in the Energy Efficiency and Conservation Master Plan up to 2030 (EECMP), detailed in Part IV of this booklet.

Additionally, SREDA's promotion of RE is closely aligned with reducing energy intensity, particularly when RE sources are utilized to substitute conventional grid electricity, natural gas, and petroleum products. By encouraging the adoption of RE, the dependency on conventional energy sources decreases for the same production activities, contributing to improvements in national energy intensity.

(The page is left intentionally blank)

Part III Energy Balance Statistics

3.1 Primary Energy Supply by Fuel Source



Unit: ktoe

Figure 6

FY	Natural gas	Oil	Coal	Non-thermal*
2014-15	23,104	6,729	1,617	339
2015-16	25,491	6,796	2,887	411
2016-17	26,028	6,486	2,318	485
2017-18	25,916	8,429	2,722	500
2018-19	27,494	7,107	4,019	649
2019-20	26,273	8,413	4,661	650
2020-21	26692	9723	4118	767
2021-22	25687	11164	4296	755

*: Non-thermal and imported electricity includes PV, hydro and imported.

Note: The following major changes were made from FY 2018-19 issue:

(1) Imported coal and imported petroleum products data have been added.

(2) Production and import data combined are being used for natural gas supply.

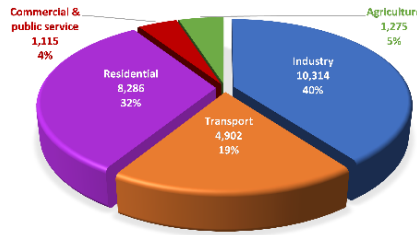
Note: Biofuels and waste are excluded from the primary energy supply.

Note: Figures may not add up due to rounding

Source: SREDA compilation based on readily-available national energy data.

3.2 Final Energy Consumption by Sector

Final energy basis data below show that industry sector consumes 40% of the entire energy (excluding biomass). Composition of residential sector is approximately one third, at 32%.



Unit: ktoe

Figure 7

Primary energy basis chart below visualizes the fact that the importance of residential sector energy consumption increases when considering the data on primary energy basis.

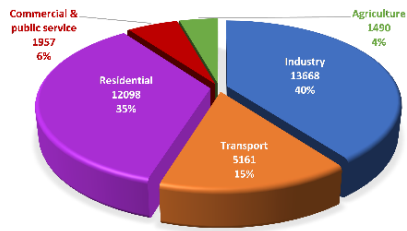


Figure 8

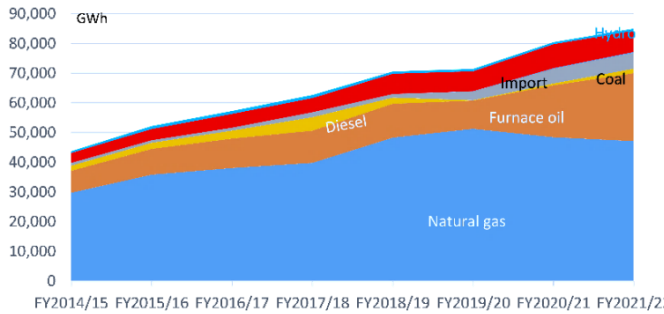
Note

Unit: ktoe

* Excludes biomass.
* Commercial and public services = compilation of commercial, building and others.
  Source: SREDA compilation based on readily-available national energy data.

3.3 Fuel Composition of Power Generation

Natural gas constantly comprises approximately 49% of the entire power generation fuels. The proportion of natural gas is increasing in the recent years in response to the start of LNG import.



Unit: GWh

FY	Natural gas	Furnace oil	Diesel oil	Coal	Solar	Import	Hydro
2014-15	29,731	7,415	1,704	941	0	3,380	566
2015-16	35,822	8,673	2,067	847	0	3,822	962
2016-17	38,052	9,950	2,627	1,009	0	4,656	982
2017-18	39,804	10,850	4,520	1,693	4	4,783	1,024
2018-19	48,308	11,426	2,022	1,230	39	6,786	725
2019-20	51,290	9,461	139	2,968	62	6,674	825
2020-21	48,403	17,497	609	4997	158	8103	655
2021-22	47,136	22,867	1,483	5,342	323	7,112	744

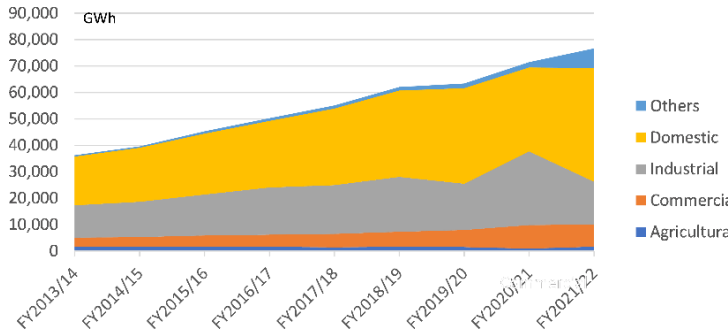
Note

* Solar power generation is not visible on graph due to its small composition.

Source: Compiled from BPDB Annual Reports data

3.4 Electricity Consumption by Sector

Residential sector is the dominant consumer of electricity. Its share rapidly increased due to more people staying home in response to COVID-19 pandemic. Decrease in industry sector electricity consumption can also be explained under the same effect.



Unit: GWh

FY	Agriculture sector	Commercial Sector *1	Industry sector	Residential Sector *2	Others
2014-15	1,636	3,685	13,306	20,470	523
2015-16	1,635	4,231	15,528	23,053	852
2016-17	1,553	4,660	17,819	25,223	1,005
2017-18	1,433	5,064	18,415	29,012	1,179
2018-19	1,613	5,701	20,733	32,662	1,328
2019-20	1,533	6,457	17,476	36,130	1,768
2020-21	798	7,908	24,680	28,178	1,800
2021-22	1,671	8,326	16,223	42,972	7,475

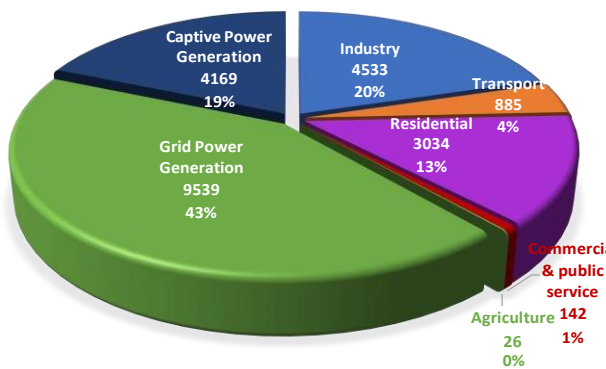
Note

* 1 Building sector is referred to as the "Commercial" sector in the original data.
* 2 Residential sector is referred to as the "Domestic" sector in the original data.

Source: Compiled from BPDB Annual Reports data

3.5 Gas Consumption by Sector

Total national consumption of natural gas during the FY 2021-22 was 30,653 MMCM, which was a slight increase from the previous fiscal year. Total natural gas consumption, during the fiscal year, when converted to calorific value, is 25,687 ktoe. Almost one third of the total natural gas consumption, equivalent to 9,539 ktoe, is allocated for grid power generation. Combining with a separately reported 4,169 ktoe for captive power generation at the industries the natural gas used for power generation surpasses 48.4% of the entire natural gas utilization. Other two major natural gas consumers are the industry sector other than captive power generation and fertilizer, amounting to 4,533 ktoe, and residential sector at 3,034 ktoe. Although the penetration of CNG fueled vehicles is high in urban areas, the consumption of natural gas in transport sector is limited at 885 ktoe, has constantly been decreasing for the past three years.

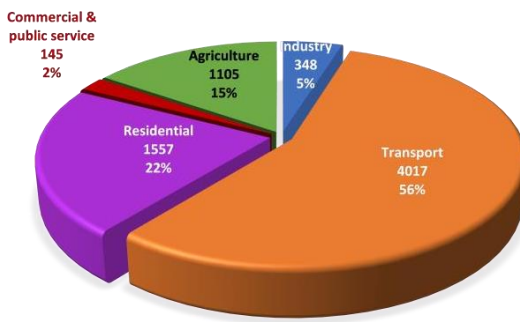


Unit: ktoe

Note: Original data in MMCM, conversion unit employed = **0.933 ktoe/MMCM**.
Source: Chart drawn based on National Energy Balance Table 2021-22.

3.6 Petroleum Products Consumption by Sector

Petroleum products sold and consumed during FY 2021-22 was 8110 ktoe, which is the summation of sales of 6,174 ktoe of various petroleum products from BPC. More than a half of the entire petroleum product supply, 4,007 ktoe, was for the **largest consuming sector**, the **transport sector**, including road, rail, domestic air and inland waterway transport. Next large petroleum products consuming sector is residential sector consuming 1,557 ktoe. The consumption of LPG in residential and Transport sector has been growing. Total LPG Consumption has been increased about 69% from previous year. Consumption of kerosene for lighting and cooking purpose is limited compared with that of LPG. Agriculture sector consumed 1,105 ktoe, of which most of the composition is diesel oil for irrigation purposes.

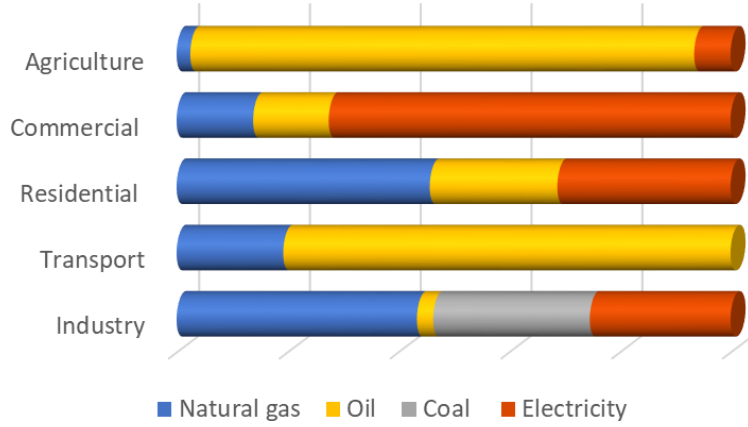


Unit: ktoe

Note: Original data in kg and ton, conversion unit employed = 0.00095 ktoe/ton.
Source: Chart drawn based on BPC annual Report Data and HCL data.

3.7 Energy Consumption by Sector & Source

The horizontal bar chart below is the energy consumption on consumption basis, by sector and source of energy for FY 2020-21. Energy source for agriculture sector and transport is mostly petroleum products, while electricity is the dominant composition for commercial sector. Residential and industry sector have fair mixes of various energy sources.

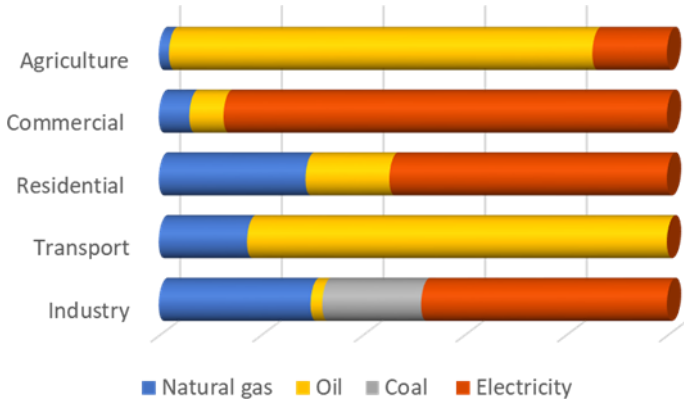


Unit: ktoe (consumption basis)

FY	Gas	Petroleum products	Coal	Electricity
Agriculture	26	956		69
Commercial	159	157		835
Residential	3541	1784		2423
Transport	926	3884		
Industry	6503	441	4237	3809

* Excludes biofuels and waste.
* Commercial and public services = compilation of commercial, building and others.Source: SREDA compilation based on readily-available national energy data.

With an aim to identify the scope for EE&C on an equal-footing among all energy sources, energy consumption by sector on **primary energy basis** is visualized in the following horizontal bar chart. When compared with the chart on the previous page, it becomes apparent that electricity consumption especially commercial, residential and industry sector, as well as petroleum products consumption in agriculture and transport sectors require further attention as the target for EE&C.



Unit: ktoe (primary energy basis)

FY	Gas	Petroleum products	Coal	Electricity
Agriculture	26	1083	0	190
Commercial	159	178	0	2308
Residential	3541	2022	0	6697
Transport	926	4403	0	0
Industry	6503	500	4237	10528

Note:

* Excludes biofuels and waste.
* Commercial and public services = compilation of commercial, building and others.

Source: SREDA compilation based on readily-available national energy data.

3.8 Calorific Value and Conversion Factor

[1] Calorific Value

Calorific value by product	Reference
Natural gas	
Domestic produced natural gas	
0.926 ktoe/MMCM (FY 2021-22)	Calculated from Petrobangla AR 2019
Re-gasified imported natural gas	
0.932 ktoe/MMCM	UNSD std heat values of gases 39,021 kJ/m3
Oil, petroleum products	
Imported crude oil	
1.01 toe/ton	UNSD 42.3 GJ/ton (net std heat values)
Domestic production condensate	
1.11 toe/ton	**SREDA estimate**
Domestic production Natural Gas Liquid (NGL)	
0.84 toe/KL	**SREDA estimate**
LPG	
1.13 toe/ton	UNSD 47.3 GJ/ton (net std heat values)
Naphtha	
1.06 toe/ton	UNSD 44.5 GJ/ton (net std heat values)
Petrol (motor spirit)	
1.06 toe/ton	UNSD 44.3 GJ/ton (net std heat values)
High octane blending component (HOBC)	
1.26 toe/ton	**SREDA estimate**
Superior kerosene oil (SKO)	
1.05 toe/ton	UNSD 44.1 GJ/ton (net std heat values)
Diesel	
1.03 toe/ton	UNSD 43.0 GJ/ton (net std heat values)
Furnace oil	
0.96 toe/ton	UNSD 40.4 GJ/ton (net std heat values)
Petroleum products (overall)	
0.95 toe/ton	Calculated from UNSD and ERL AR 2019 data
Coal	
Domestic production	
0.614 toe/ton	BCMCL website: 25.68MJ/kg or 6,072kcal/kg
Imported	
0.610 toe/ton	**SREDA estimate**
Electricity	
Consumption basis = 0.086 toe/MWh	
Primary basis = 0.244 toe/MWh	BPDB AR FY2021-22 T&D loss, thermal efficiency

[2] Conversion Factor

1 BTU	= 2.52×10^{-8} toe
1 BTU	= 0.000293071 kWh
1 MJ	= 2.39×10^{-5} toe
1 MJ	= 0.2778 kWh
1 kWh	= 8.60×10^{-5} toe (consumption basis)
1 toe	= 11,630 kWh /11,662.22 kWh at 59ºF
1 cft	= 0.0283168 m^3
1 BBL (US)	= 0.159 m^3
1 BBL (UK)	= 0.163 m
1 ton of Petroleum product	= 0.00095 ktoe

Part IV National Energy Security and EmissionReduction

(The page is left intentionally blank)

4.1 Overview

Bangladesh, with a population of approximately 169.11 million spread across 148,460 km², ranks among the world's most densely populated countries. Initially focused on ensuring food security, Bangladesh has made significant strides in this regard. Now, the nation's attention turns to addressing energy security as a primary concern.

Energy security

Bangladesh has achieved universal electrification, marking a significant milestone in its development. The country's economic conditions have notably improved, leading to its transition from a Least Developed Country (LDC) to a Developing Country. This economic progress has resulted in increased energy consumption among the population.

Previously, Bangladesh had over 6 million Solar Home Systems (SHS), but it was observed that people were not satisfied with the limited electricity provided. Similarly, Solar mini-grids faced challenges due to their restricted supply capacity, prompting consumers to seek grid-connected electricity solutions. Presently, only 27 mini-grids directly provide electricity to consumers. Quality control remains a concern for solar products.

Bangladesh has made significant strides in expanding grid connectivity, including connecting remote areas like Sandwip Island through submarine cables. Additionally, consumers who were previously served by mini-grids are now transitioning to grid-connected electricity through submarine cables. Grid substations have been established in districts such as Khagrachari and

Rangamati, particularly in the Chattogram Hill Tracts (CHT) area. Overall, Bangladesh's efforts in achieving universal electrification and improving energy access demonstrate its commitment to advancing socio-economic development and ensuring energy security for its citizens.

Shortage of Primary fuel is a problem in Bangladesh. Its natural gas is depleting fast. Due to local problems most of the high-quality coal is unable to extract. Only Hydro project at Kaptai annual average yield is not more than 50 MW OR Day peak is 30 MW and evening peak is 71 MW.

In this situation, it needs an accurate picture of its energy demand and availability. For this a correct Energy balance is a requirement.

In Bangladesh, the pressing challenge of dwindling primary fuel reserves, particularly natural gas, necessitates a strategic shift towards alternative energy sources. With limited high-quality coal extraction and modest hydroelectric capacity at projects like Kaptai, the country faces an urgent need for a comprehensive understanding of energy demand and availability.

The paramount concern remains providing robust grid connectivity and reliable electricity to consumers, especially in light of the limitations of Solar Home Systems (SHS) and Mini-Grids. Land constraints pose a challenge to scaling up utility-scale solar power generation, despite its potential as a sustainable energy source.

In response to these challenges, Bangladesh has embarked on the development of nuclear energy with stringent safety measures, aiming to bolster its energy mix. However, the predominant reliance on natural gas, accounting for over 60% of total

generation, underscores the urgency of diversification efforts. Despite the disruptions caused by the pandemic, Bangladesh is actively exploring avenues for energy security, including electricity imports and potential large-scale hydro imports from neighboring countries. The transition away from biomass towards cleaner alternatives like LPG and electric appliances reflects the country's commitment to sustainable energy practices.

Coal is gradually gaining prominence in the energy mix, supported by the gradual expansion of coal-based power plants. Transparency in private coal imports, including caloric value and emissions data, is paramount for informed decision-making.

Captive power generation plays a pivotal role in the energy landscape, necessitating accurate fiscal-year-wise data for comprehensive energy balance assessments. Stakeholder collaboration and timely data submission to organizations like SREDA are crucial for informed energy planning and projection.

The government's prioritization of carbon emission reduction aligns with Sustainable Development Goals (SDGs), driving initiatives like SREDA to promote Renewable Energy (RE) and Energy Efficiency and Conservation (EE&C). Energy efficiency emerges as a cost-effective strategy for emission reduction, with every 1 MW of electricity saved costing less than half the expense of generating the same, resulting in substantial carbon emission reductions.

In conclusion, Bangladesh's energy landscape presents both challenges and opportunities, demanding strategic foresight, collaboration, and innovation to ensure sustainable energy security and mitigate climate change effectively.

For EE&C, a Masterplan requirement was felt. Accordingly, Master Plan up to 2030 was prepared with sets specific targets to achieve by fiscal year (FY) 2021-22 and by 2029-30. To achieve these

targets, the master plan identified five major interventions which are:

(i) Energy audit
(ii) EE&C building
(iii) EE&C labelling
(iv) EE&C finance
(v) Awareness raising.

The fourth of these essential interventions is the Energy Efficiency & Conservation Promotion Financing Project (EECPFP) of SREDA. To encourage the industries to choose energy-efficient equipment when they invest, the project is providing low-interest loans.

In addition to the funding, the project is carrying out technical support such as information sharing, energy audits, and capacity building exercises. With assistance from the Japan International Cooperation Agency (JICA), the project is being carried out.

Other Developing Partners & Private sector involvement in EE

The EE&C program has received resounding support from the developing partners. In addition, JICA, the World Bank, ADP, UNDP, KfW, and others have offered assistance for EE&C initiatives.

Large-scale EE&C projects are financed by international institutions like HSBC, which are in favor of reducing carbon emissions.

4.2 Demand-side Energy Efficiency

The government of Bangladesh has embraced a holistic energy development strategy aimed at enhancing energy access by exploring supply-side options while concurrently implementing demand management measures to conserve energy and discourage inefficiency. Central to this strategy is the reduction of energy consumption required to deliver goods and services, emphasizing energy efficiency as a key pillar for sustainable energy provision.

Efficient energy utilization not only fosters sustainable transport and affordability but also bolsters energy security and environmental sustainability. Recognized as the most straightforward and cost-effective approach to curbing carbon emissions, enhancing energy efficiency yields substantial financial benefits, enabling industries and societies to achieve more with less energy input, delivering public services at reduced costs, and alleviating fuel poverty.

Moreover, reducing energy demand alleviates pressure on energy supplies, underscoring the significance of behavioral shifts at individual, community, business, and public sector levels. Energy balance calculations for energy efficiency and conservation underscore the government's dedication to promoting efficient energy usage. By establishing a framework for energy efficiency and conservation, these calculations empower the government to address climate change, economic, and social agendas by setting energy-saving targets and delineating actionable steps to achieve them.

Energy efficiency primarily hinges on controlling and minimizing energy demand, necessitating targeted interventions across both consumption and supply domains. Given the cross-cutting nature of energy efficiency and conservation, involving various government agencies, energy balance calculations serve as a valuable tool for informing forthcoming plans and strategies.

4.3 Master Plan Targets

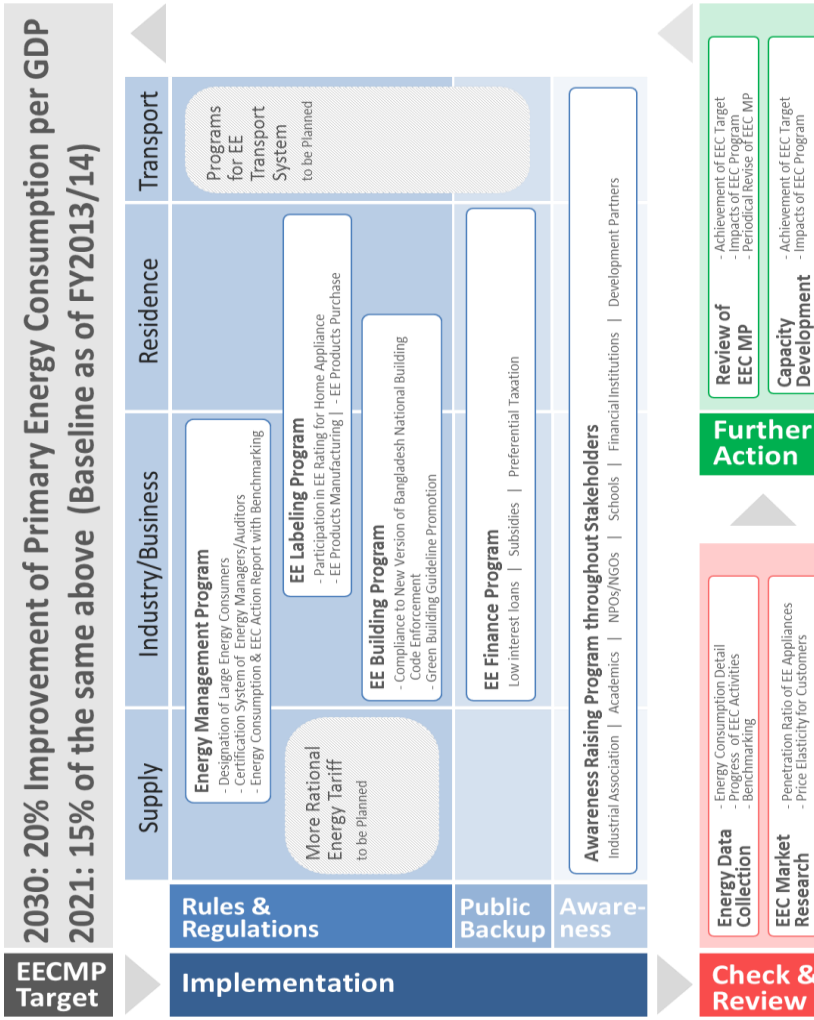
With assistance from the Japan International Cooperation Agency (JICA), SREDA created the "Energy Efficiency and Conservation Master Plan (EECMP) up to 2030" in May 2016 in order to determine the essential steps needed to meet the country's energy efficiency targets. The following are the objectives listed in the EECMP:

- Target for FY 2029-30 (long-term): to reduce primary energy per GDP (= national energy intensity) by 20%

(Note: the targets are set against the actual figure observed in FY 2013/14 as the base year).

The diagram (Figure 6) illustrates the comprehensive framework of the Energy Efficiency and Conservation Master Plan (EECMP). At the core of the diagram lie five pivotal actions essential for achieving the targets outlined in the MP. These actions encompass: (i) Energy Management Program, (ii) EE&C Labelling Program, (iii) EE&C Building Program, (iv) EE&C Finance Program, and (v) Awareness-Raising Program. Presently, all these core actions are either under implementation or in the preparatory phase.

SREDA, serving as the responsible authority, spearheads the execution of these five actions to realize the national objectives delineated in the EE&C MP. Among the identified programs, SREDA is actively implementing the EE&C Promotion Financing Project (EECPFP), financed by JICA, alongside conducting awareness-raising initiatives and energy management programs for industries. Furthermore, SREDA is in the developmental stages of crafting regulations for energy labelling and building rating programs



Source: Energy Efficiency and Conservation Master Plan (MP) up to 2030

Figure 6 Structure of the Energy Efficiency & Conservation Master Plan up to 2030

Energy-saving initiatives led by SREDA will directly impact power supply by curbing power demand. If energy demand can gradually decrease from 2015 to 2030, achieving a 20% reduction, the peak demand in 2030 will be 29.5 GW. Conversely, in the Business-As-Usual (BAU) scenario without energy-saving measures, a power supply capacity of 36.9 GW will be required by 2030. This indicates a potential reduction of 7.4 GW in power supply capacity due to energy-saving efforts.

Under the 20% energy-saving scenario, an estimated CO2 emission reduction of 246.5 million t-CO2 is anticipated over the 15-year implementation period.

4.4 EE&C in National & International Policies

According to Targets 7.1, 7.2, and 7.3 of the Sustainable Development Goals (SDGs), achieving universal access to affordable and modern energy services by 2030, significantly increasing the share of renewable energy in the global energy mix, and doubling the global rate of improvement in energy efficiency are paramount.

In Bangladesh's 8th Five-Year Plan, the government targets a 15% improvement in Primary Energy Consumption per GDP by 2021 and aims for a 20% improvement by 2030.

In December 2015, the Paris Agreement was issued at the United Nations Climate Change Conference, COP 21, with participation from 196 countries. The primary focus of discussion was on international legal frameworks to combat global warming post-2020. Key highlights of this agreement include:

a) Global average temperature should be well below 2°C compared to pre-industrial levels

b) Zero net anthropogenic greenhouse gas emissions to be reached during the second half of the 21st century

The importance of EE&C will continue to rise in line with the general consensus on the finite amount of fossil fuels and the significance of mitigating global warming. In light of this, SREDA plays a critical role in advancing EE&C and lowering CO2 emissions.

As of now, Bangladesh has several policies on Energy Efficiency and Conservation sector.

a. National Energy Policy 1996.

b. The Energy Efficiency and Conservation Rules, 2016
c. The Energy Audit Regulation, 2018
d. Energy Efficiency and Conservation Master Plan upto 2030
e. Bangladesh National Building Code 2020
f. 8th Five Year Plan
g. Electric Vehicle Charging Station Guideline, 2022

4.5 Energy Efficiency & Conservation Promotion Financing Project (EECPFP)

The EECPF Project employs a two-step loan mechanism to facilitate policy financing. SREDA administers this low-interest loan, targeting industries investing in energy-efficient equipment and machinery, albeit slightly pricier than conventional alternatives. By reducing financial costs, SREDA incentivizes investors towards energy-efficient choices.

Three executing agencies oversee the EECPF Project: SREDA, Infrastructure Development Company Limited (IDCOL), and Bangladesh Infrastructure Finance Fund Limited (BIFFL). SREDA assumes administrative authority, managing overall implementation. It serves as the technical hub, evaluating equipment eligibility and assessing energy-saving impacts.

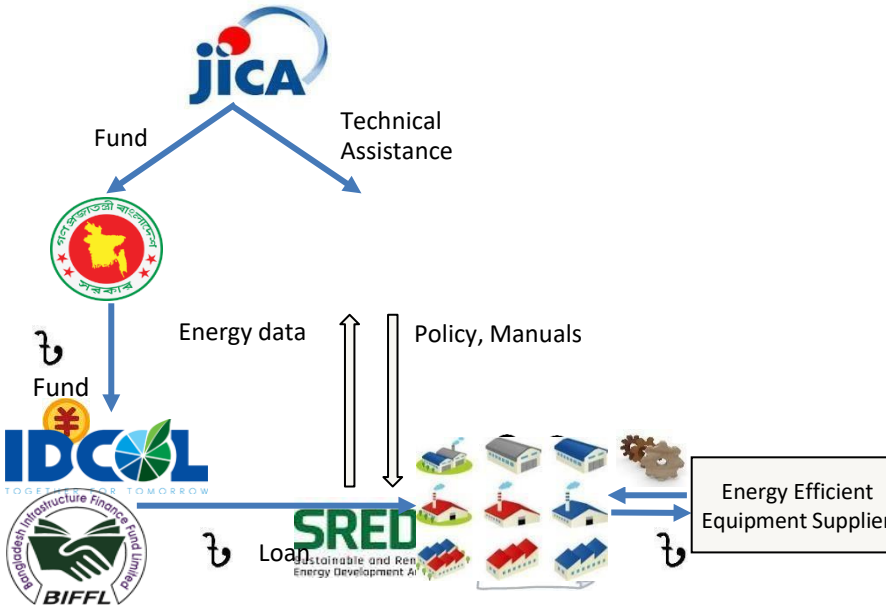


Figure 7 Mechanism of Energy Efficiency and Conservation Promotion Financing Project

For the Project, there is also an infrastructure for data management. On SREDA's online Project Management Information System (MIS), the enterprises that make use of the energy-efficient equipment provide information about their monthly energy usage and production quantities.

Energy savings potential of 33,071 toe (ton oil equivalent) or 116,852 MWh annually was estimated using the energy-efficient

equipment introduced through the Project loan amounts to save. If one MWh of electricity costs BDT 8,150 per unit, then these 21 sub-projects will save a total of BDT 950 million in energy costs annually.

4.6 Energy Management Programme

To guarantee EE&C, particularly in the commercial (building) and industrial sectors, SREDA has been putting a lot of effort into introducing Energy Management Programs and Energy Audit Programs. Consequently, the Energy Audit Regulations 2018 have been implemented, which include the installation of energy managers at various sectors. SREDA is carrying out its Energy Audit Program in compliance with the regulations. The certification exam for energy auditors, audits in designated consumers, the responsibility of energy auditors, and the certification and audit procedure for energy managers are the main components of the Energy Audit Program. In 2019, SREDA began preparing for the Energy Audit Certification exam.

4.7 Standard, Testing & Labelling

The EE&C Labelling Program aims to boost the adoption of energy-efficient appliances in the market, focusing primarily on household items like air conditioners, refrigerators, TVs, lights, fans, and motors. With rapid economic growth driving an increase in household appliance usage, this program is crucial for promoting energy efficiency and conservation in the residential sector. The adoption of energy-efficient appliances not only reduces energy consumption (measured in kWh) but also alleviates electricity demand (especially peak load demand in kW) and lowers carbon emissions.

SREDA is currently refining a more comprehensive energy efficiency and conservation labelling scheme, slated for introduction by 2021.

4.8 Building Energy Efficiency and Environment Rating

SREDA will promote and carry out five primary initiatives, one of which is building energy efficiency. A draft Building Energy Efficiency and Environment Rating (BEEER) system has been developed to encourage EE&C in the building industry. This ranking scheme will be optional.

4.9 Awareness Raising Activities

The government is encouraging the development of novel mechanisms to guarantee EE&C in the residential, commercial, and industrial sectors. To increase awareness among pertinent stakeholders, Power Division and SREDA regularly organize seminars, workshops, fairs, expos, competitions, etc. SREDA is responsible for the School Awareness Program, the incorporation of EE&C and RE-related activities in secondary and higher secondary curricula, participation in National Electricity Week, and the organization of seminars, workshops, among other events.

Conclusion

Due to some limitations, limited information was used in the preparation of the National Energy Balance 2021–22. The follow-up publication, National Energy Balance for 2021–22, will be enhanced with more pertinent information. Making policy decisions about carbon emissions and energy security will be greatly aided by this booklet.

Sustainable and Renewable Energy Development Authority (SREDA)

IEB Building (9th and 10th Floor), Ramna, Dhaka-1000

Phone: +880255110340, Fax: +880255110341

www.sreda.gov.bd