



Ministry of Power and
Energy Sri Lanka

WB Energy Efficiency Program Support in Sri Lanka



Sri Lanka Sustainable
Energy Authority

Implementation and Financing Mechanisms in Commercial, Public & Industrial Buildings Sectors

National Consultation and Dissemination Workshop

November 10, 2022

Energy Efficiency Potential in Commercial, Public and Industrial buildings



Content

1. Building Sector's Contribution to Electricity Consumption
2. Evaluation of Energy Efficiency Potential
 - a) Energy Efficiency Potential in Cooling (Air Conditioner and Chillers)
 - b) Energy Efficiency Potential in Lighting

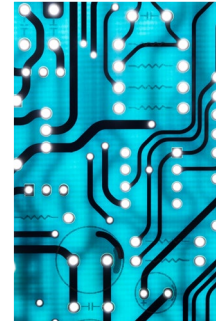
Energy Efficiency Potential in Lighting and Cooling

Purpose Identify the energy efficiency potential and investment needed to unlock it.



Focus Sector

Existing Public, Commercial and Industrial Buildings



Technologies Considered

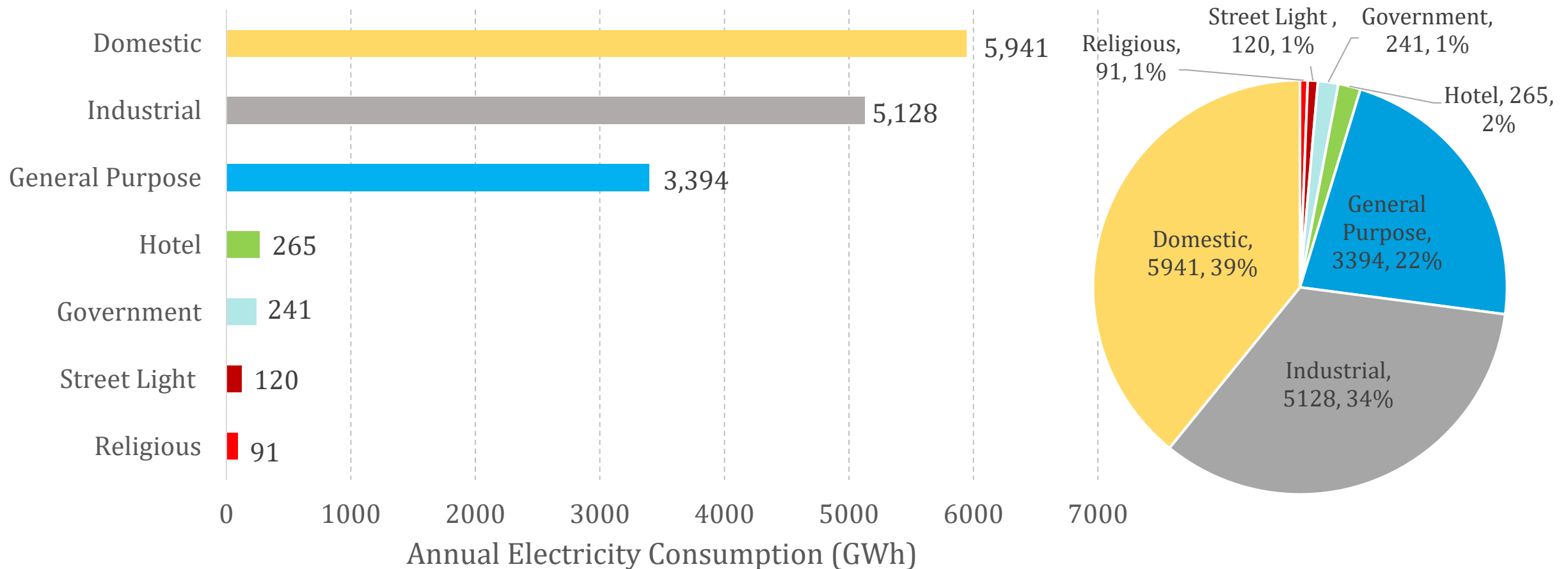
Lighting & Controls
Cooling



Within Energy Efficient Cooling
Room Air Conditioners
Chillers



Building Sector's Contribution to Electricity Consumption



Annual Electricity Consumption (GWh) for all building sectors.
Source: CEB Annual and Statistical Digests 2021

Potential for Energy Efficient Cooling

Room Air Conditioners & Chillers

Room Air Conditioners

1

Stock for Industrial and Commercial Buildings

5-year sales data from Customs

Forecast Sales for 2022-2031

Estimated installed stock (2022-2031)

Estimated sales & stock for Commercial & Industrial

2

Cost of technology

Determined average cost of RAC (1.5 TR)

- Conventional RAC (~EER 3.1 @ \$650)

- EE RAC (~SEER 4.6 @ \$950)
(based on market research)

3

Electricity Saving and Cost Saving Potential

Estimate Energy Saving Potential and Cost Saving Potential for retrofit

Projected savings calculations for future stock of commercial and industrial sectors

4

Investment Required

Based on assessment of market sales, product cost, electricity cost and respective inflation.

Investment required for incremental cost of energy efficient RAC



Energy Efficiency Potential: Room Air Conditioners

2021

Present – Nov 2022

Description (Assessment Period 2022-2031)	Potential estimates
Investment for incremental cost (\$)	505 million USD
Potential electricity savings (GWh)	4,200 GWh
Cost savings (\$) (savings through cost of electricity)	720 million USD

Inputs for cost savings:

Cost of electricity – 22.85 LKR/kWh (0.114 USD/kWh)
 Currency value – 1 LKR is 0.005 USD

Description (Assessment Period 2022-2031)	Potential estimates
Investment for incremental cost (\$)	505 million USD
Potential electricity savings (GWh)	4,200 GWh
Cost savings (\$) (savings through cost of electricity)	545 million USD

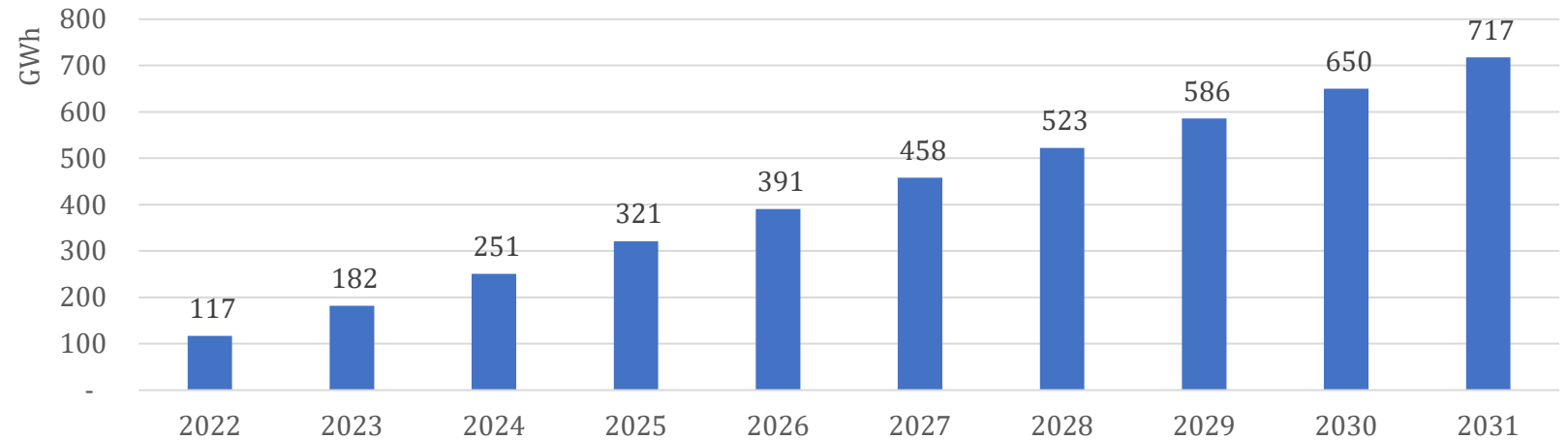
Inputs for cost savings:

Cost of electricity – 32 LKR/kWh (0.086 USD/kWh)
 Currency value – 1 LKR is 0.0027 USD

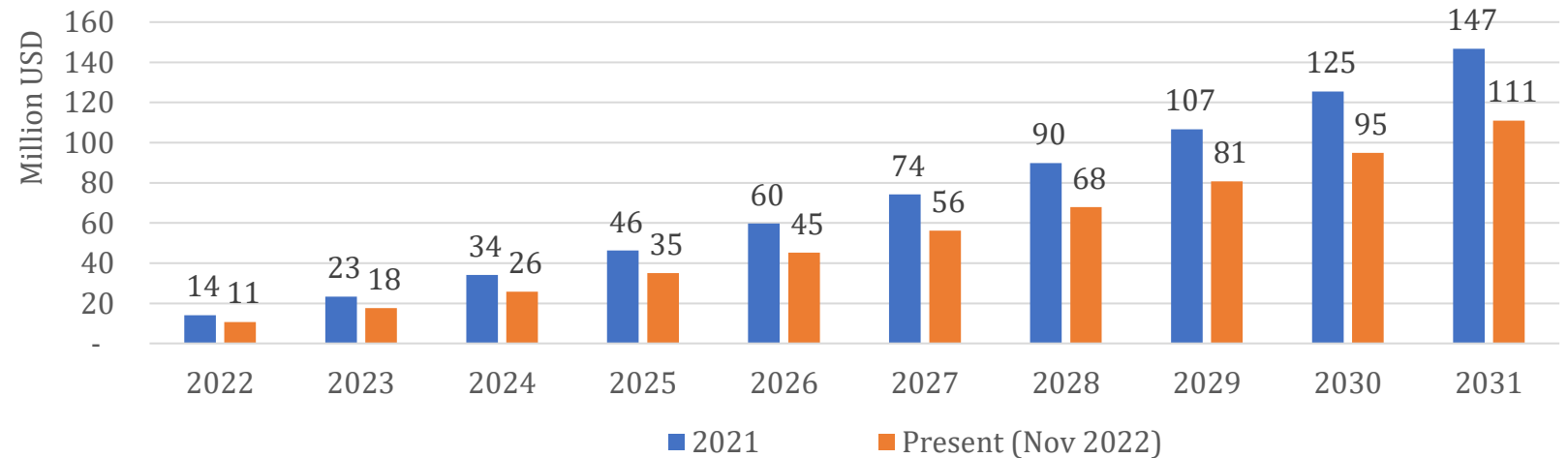


Energy Efficiency & Cost Savings Potential: Room Air Conditioners

Potential electricity savings (yearly)



Cost savings (\$/year) (Savings through cost of electricity)



Chillers

1

Stock Assessment

Annual historical sales data

Forecast sales for 2022-2031

Estimated installed stock (2022-2031)

2

Cost of technology

Determined average cost of chillers
(Representative capacity assumed - 200 TR)

- Conventional Chiller (~0.9 kW/TR @ \$1500/TR)

- EE Chiller (~0.54 kW/TR @ \$300/TR-incremental cost)
(based on market research, literature review)

3

Electricity Saving and Cost Saving Potential

Estimate Energy Saving Potential and Cost Saving Potential for retrofit

Projected savings calculations for estimated penetration of EE chillers

4

Investment Required

Based on assessment of market sales, product cost, electricity cost and respective inflation.

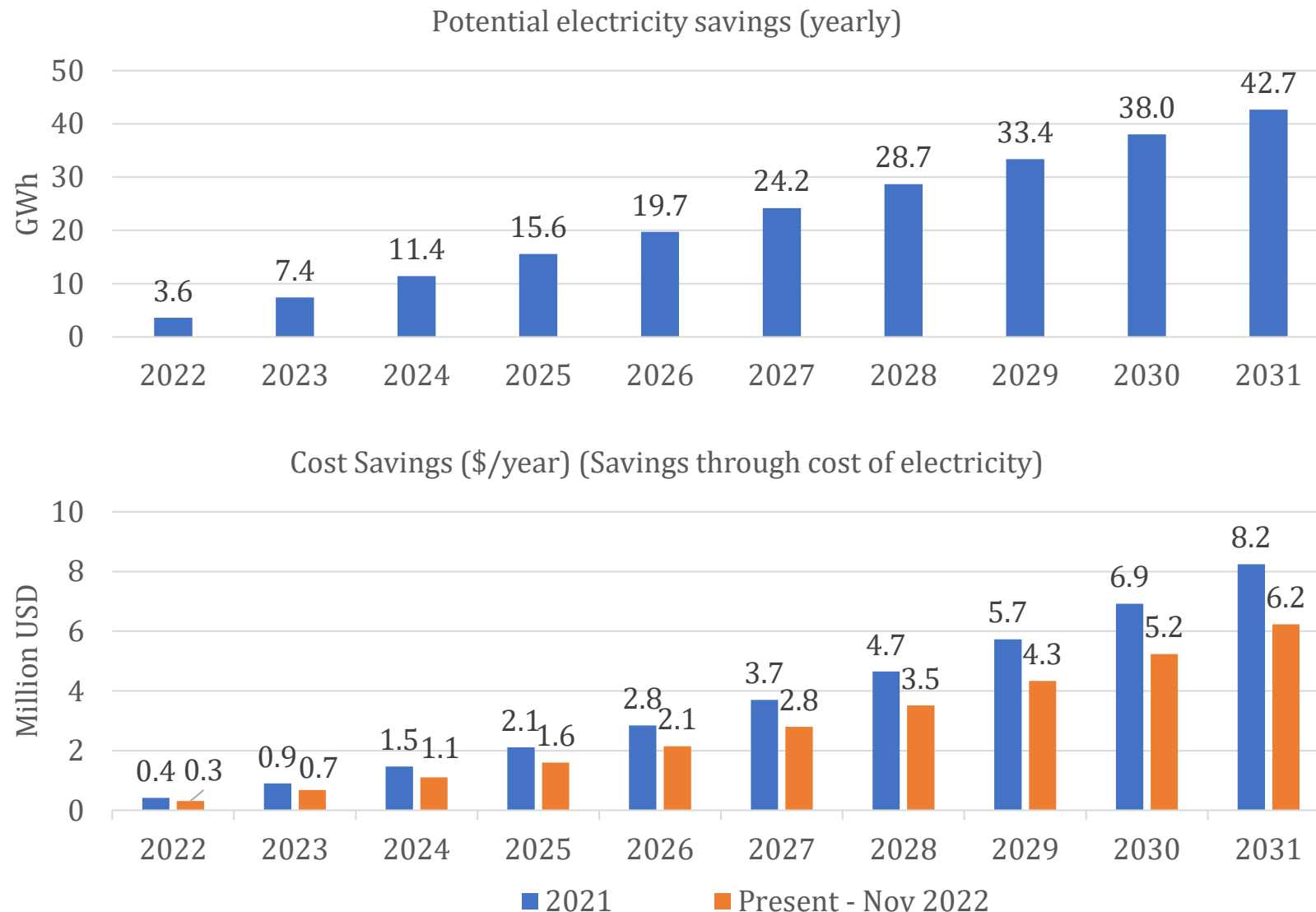
Investment required for incremental cost of energy efficient chiller



Energy Efficiency Potential: Chillers

Description (Assessment Period 2022-2031)	Potential estimates	
	2021	Nov 2022
Investment for incremental cost (\$)	22 million USD	22 million USD
Potential electricity savings (GWh)	225 GWh	225 GWh
Potential cost savings (\$)	37 million USD	28 million USD

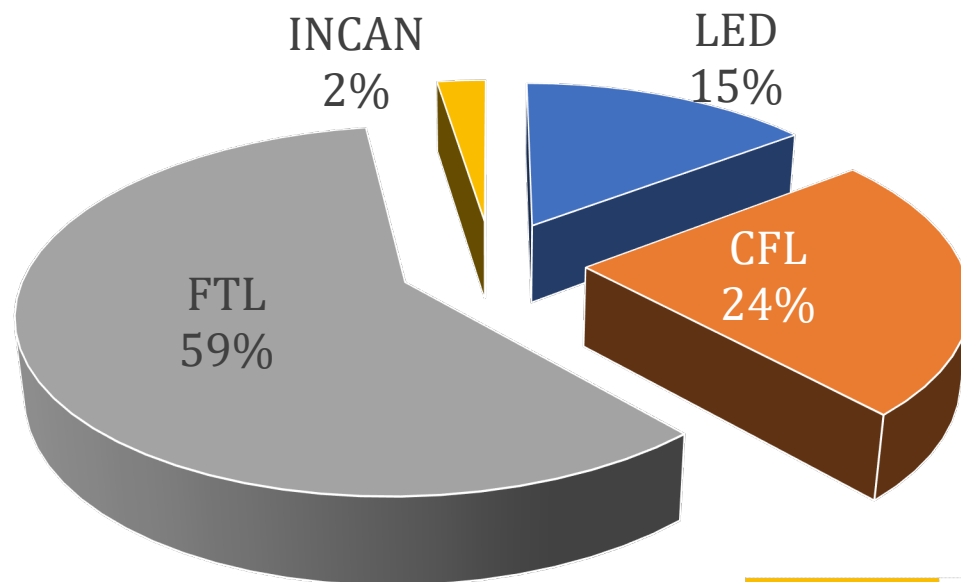
Energy Efficiency & Cost Savings Potential: Chillers



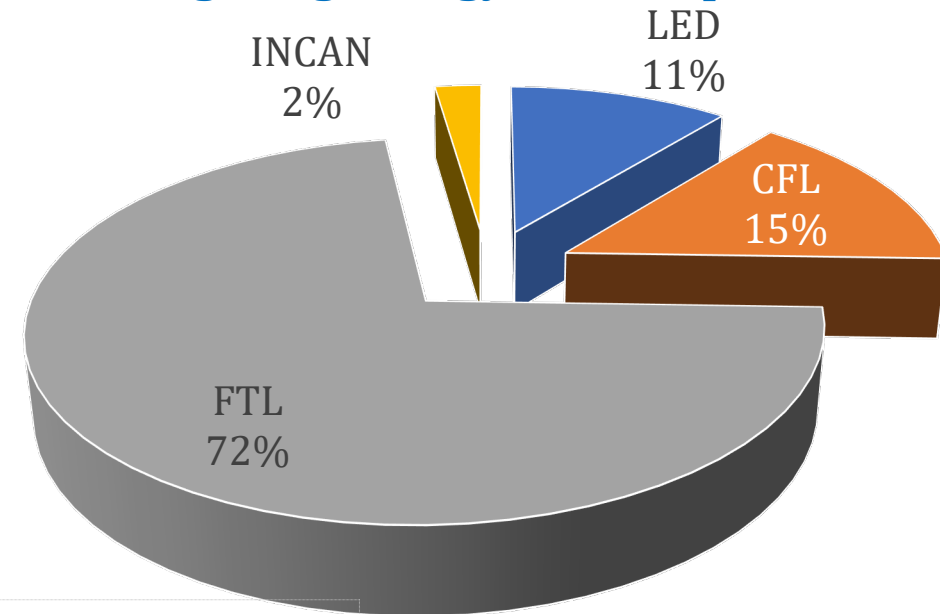
Potential for Energy Efficient Lighting

Lighting Survey Results

Lighting by Count



Lighting Energy Consumption



INCAN	Incandescent Bulb
LED	Light Emitting Diode
CFL	Compact Fluorescent Lamp
FTL	Fluorescent Tubular Lamp



Energy Efficiency Potential: Lighting

Sector	Sector Electricity Consumption (GWh) for 2019	Electricity Savings over life (GWh)	% Saving	2019		Present – Nov 2022	
				Cost Savings over the service life (Rs. Mn)	Investment (Rs. Mn)	Cost Savings over the service life (Rs. Mn)	Investment (Rs. Mn)
GP1	1901	559.2	5%	14,442	3,850	20,232	9,625
GP2	1039	496.2	8%	16,206	2,923	21,642	7,308
GP3	347	146.4	7%	3,672	297	4,992	742
H1	3	1.8	10%	36	6	54	15
H2	222	191.4	14%	3,630	669	6,678	1,673
H3	107	10.8	2%	192	29	354	72
I1	343	180	9%	2,304	421	6,042	1,053
I2	2200	892.8	7%	15,036	6,621	34,512	16,552
I3	1780	47.4	0.4%	690	431	1,644	1,077
GV1	6	4.2	11%	78	13	168	33
GV2,3	185	209.4	19%	4,404	505	8,142	1,262
Total	8,133.0	2740	6%	60,690	15,765	104,460	39,412
				~300 Mn USD	~80 Mn USD	~280 Mn USD	~107 Mn USD



Total Potential for Energy Efficiency in Building Sector

Cooling

Description (assessment period 2022 to 2031)	Potential estimates
Investment required for incremental cost (\$)	527 million USD
Potential electricity savings (GWh)	4,425 GWh
Potential cost savings (\$)	757 million USD

Lighting

Description	Potential estimates
Total investment required (\$)	80 million USD
Potential electricity savings (GWh) over service life	2740 GWh
Potential cost savings (\$) over service life	300 million USD

Thank You

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