



Energy Efficient Lighting


Introduction to LVD-Technology

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in case of any query



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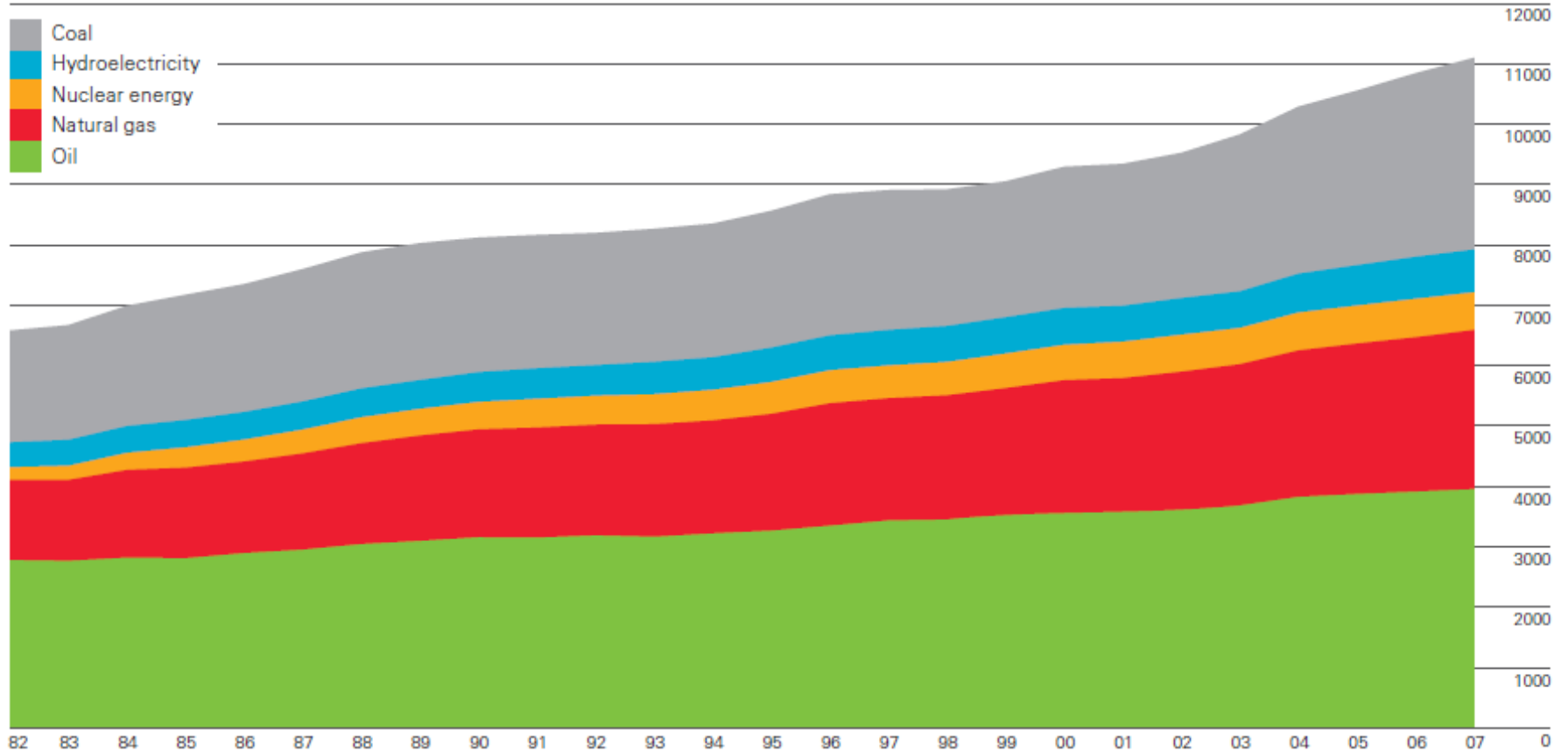
Table of Content

- Increased global energy consumption and needs for energy efficiency and environment protection
 - Needs for energy efficiency in India
 - LVD R & D Team
 - LVD Showroom
 - Invention of LVD technology and its applications
 - Outstanding features of LVD
 - Comparisons on performance between LVD and other lighting technologies
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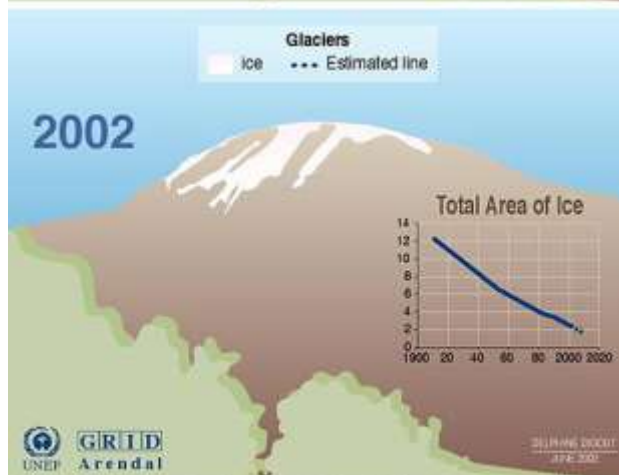
Global energy consumption

World consumption

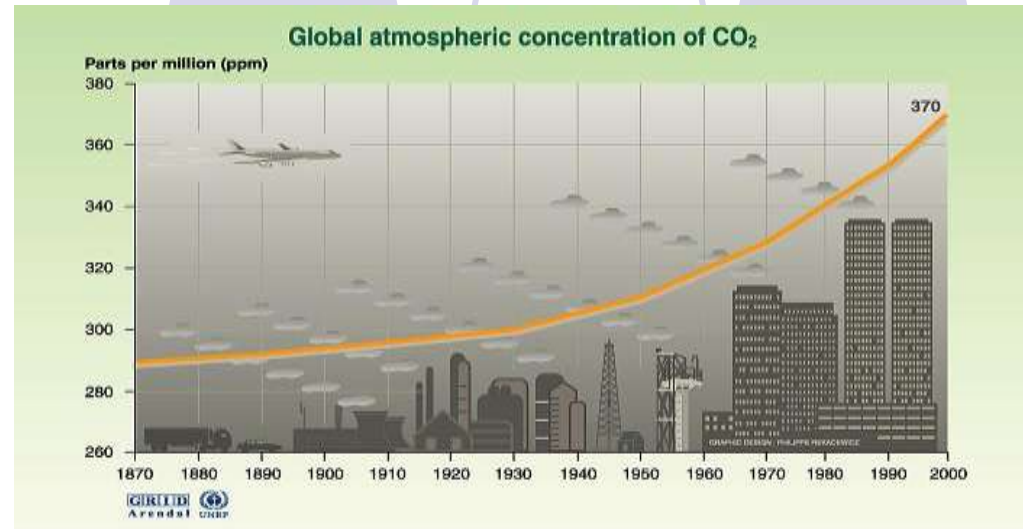
Million tonnes oil equivalent



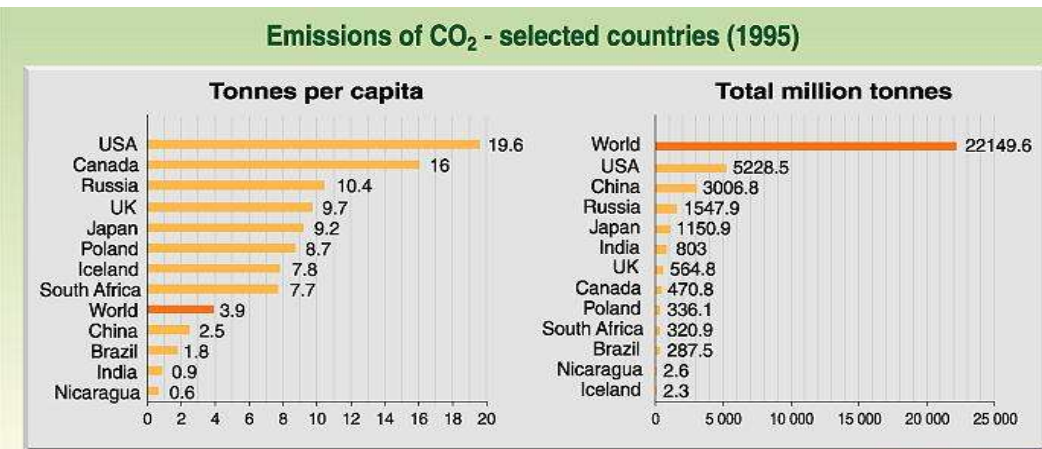
Climate Change & Emission of CO₂



Sources: Meeting of the American Association for the Advancement of Science (AAAS), February 2001 ; Earthobservatory.nasa.gov.



Source: TP Whorf, Scripps, Mauna Loa Observatory, Hawaii, Institution of oceanography (SIO), University of California La Jolla, California, United States, 1999



Source: International Energy Agency, 1998.

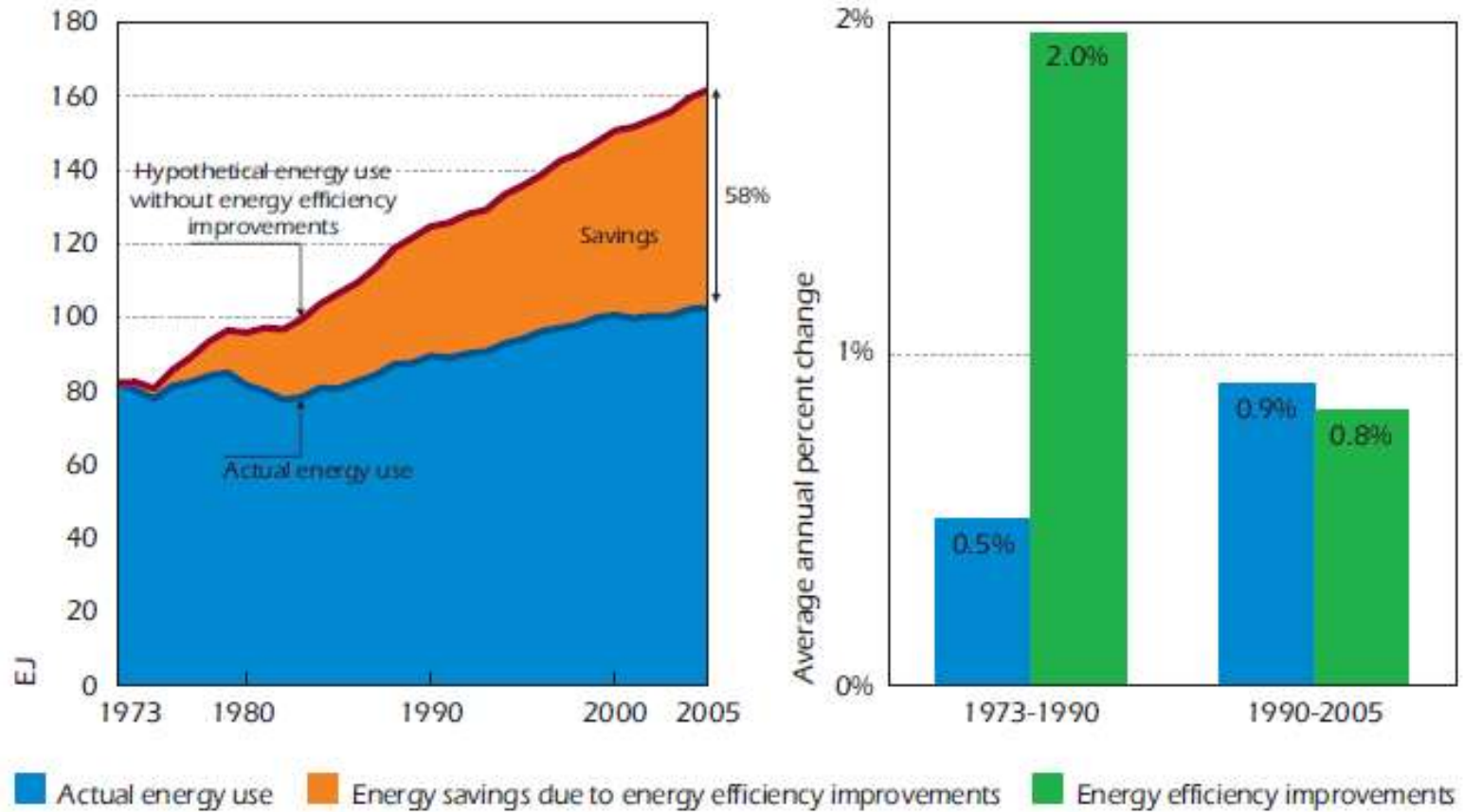
Energy Efficiency

- “**Efficient energy use**, sometimes simply called **energy efficiency**, is using less energy to provide the same level of energy service.”
- “Efficient energy use is achieved primarily by means of a more efficient technology or process rather than by changes in individual behaviour.”

————— WIKIPEDIA, 2009,. “Efficient energy use”, available online:
http://en.wikipedia.org/wiki/Energy_efficiency [accessed on 20th April 2009]

- [Energy efficient buildings](#), industrial processes and [transportation](#) could reduce the world's energy needs in 2050 by one third, and help controlling global emissions of [greenhouse gases](#), according to the [International Energy Agency](#)

Figure 2.9 ▶ *Long-Term Energy Savings from Improvements in Energy Efficiency, All Sectors, IEA11*



Source: IEA indicators database.

Generation & Power supply position in India

The power supply position from 1997-98 onwards are as under :

Year	Energy Requirement (MU)	Energy availability (MU)	Energy shortage (MU)	Energy Shortage (%)
1997-98	424505	390330	34175	8.1
1998-99	446584	420235	26349	5.9
1999-00	480430	450594	29836	6.2
2000-01	507216	467400	39816	7.8
2001-02	522537	483350	39187	7.5
2002-03	545983	497890	48093	8.8
2003-04	559264	519398	39866	7.1
2004-05	591373	548115	43258	7.3
2005-06	631554	578819	52735	8.4
2006-07* (*upto Jan.'07)	572812	519656	53156	9.3

Peak Demand :


Year	Peak demand (MW)	Peak Met (MW)	Peak shortage (MW)	Peak Shortage (%)
1997-98	65435	58042	7393	11.3
1998-99	67905	58445	9460	13.9
1999-00	72669	63691	8978	12.4
2000-01	78037	67880	10157	13.0
2001-02	78441	69189	9252	11.8
2002-03	81492	71547	9945	12.2
2003-04	84574	75066	9508	11.2
2004-05	87906	77652	10254	11.7
2005-06	93255	81792	11463	12.3
2006-07* (*upto Jan.'07)	100403	86425	13978	13.9

Indian Government Policy

- **Rural Electrification Policy** (aiming at provision of access to electricity to all households by year 2009; at quality and reliable power supply at reasonable rates; minimum lifeline consumption of 1 unit per household per day as a merit good by year 2012).
- **Indian Industry Program for Energy Conservation** launched by BEE in 2002.
- BEE has supported **Pilot Project** in the state of Maharashtra and Karnataka in the areas of Municipal water pumping, street lighting and domestic lighting with the replacement of ordinary lamps.
- **Professional Certification and Accreditation**. (Certified energy managers and accredited energy auditors in tandem can influence top management decision on implementation of energy efficiency projects in energy intensive industries and establishments).

Indian Government Policy



- **State Designated Agencies** to coordinate, regulate and enforce the provisions of Energy Conservation Act 2001
 - **National Energy Conservation Awards**
 - **National Campaign on Energy Conservation** launched by Ministry of Power (focusing on the creation of consumer awareness, and on understanding of the necessity and significance of energy conservation)
- 

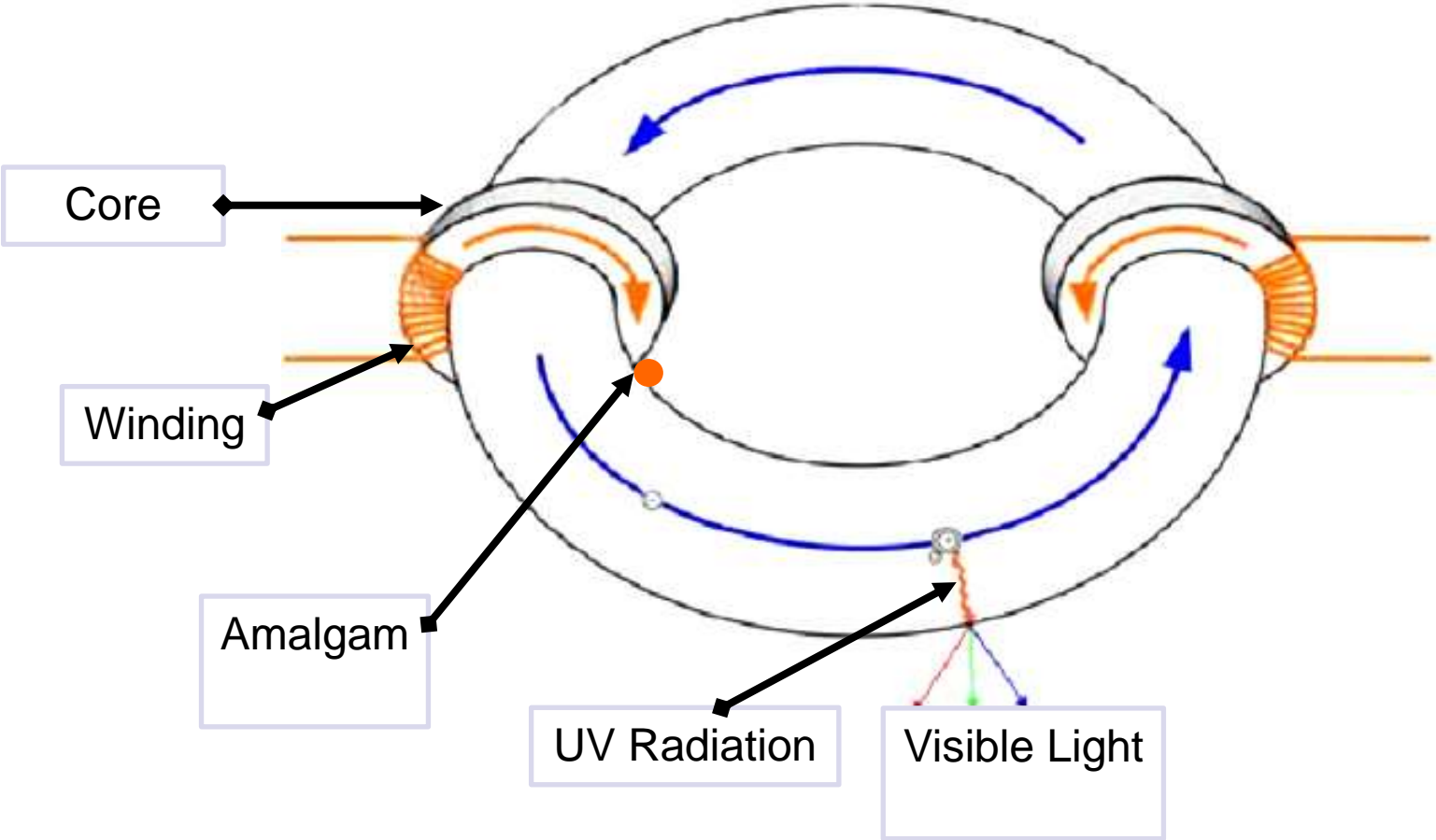
LVD R & D Team



LVD Showroom

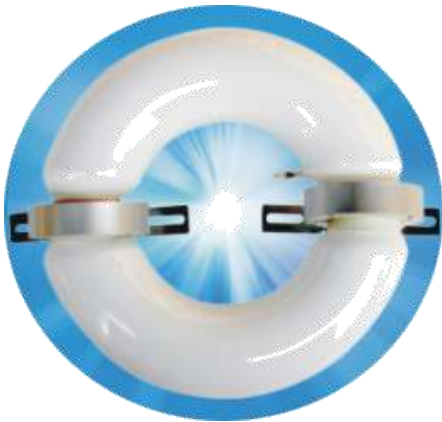


Invention of LVD technology



LVD products & Applications in real world

Tube Family



Saturn Series



Venus Series



Smart Dragon Series

LVD products & Applications in real world

Final Products



Outstanding features of LVD

- **Low** cost in terms of the purchase in the lighting facility (**100,000** working hours before replacement).
- **Low** cost in terms of the consumption of electricity (Luminous Efficiency: **139**plm/w; Power Factor: up to **0.99**)
- **Stability** (perfect performance between 180-250V)
- **Instant startup** (the lamp can be lighted within 2 seconds if operating environment for ballast is $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and \pm working voltage)

Outstanding features of LVD

- **Eco-friendly** (the content of solid mercury inside LVD is less than international standard, 5mg)
- **Self-protection for Ballast when short circuit**
- High Color Rendering Index (**CRI** up to **82**)
- High degrees of protection provided by enclosure (up to **IP66**)
- At least **5 years** quality guarantee
- Simple but fashion and elegant appearance, etc.

Comparisons (LVD & Other Lighting Technologies)

ITEM	LVD	MHL	HPS	HML	FL
Life time (hours)	100,000	6,000-20,000	24,000	3,000-6,000	8,000-12,000
Light efficiency	150 Plm/W 80 lm/W	110 Plm/W 75 lm/W	90 Plm/W 120 lm/W	43 Plm/W 50 lm/W	69 Plm/W 70 lm/W
Depreciation	5% @ 2000 hrs	40% @ 2000 hrs	30% @ 2000 hrs	45% @ 2000 hrs	25% @ 2000 hrs
CRI	> 80	65-90	60	45	70
Flicker, glare	no	Too much	Too much	Too much	have
Energy saving efficiency	Excellent	poor	poor	poor	better
Lamp surface temperature	< 80 °C	> 300 °C	> 350 °C	> 300 °C	< 100 °C
Wearing parts	No filament, no electrode, no damage of the delicate components	have filament and electrode, heavy damage of the delicate components	Have filament and electrode, heavy damage of the delicate components	have filament and electrode, heavy damage of the delicate components	have electrodes, have damage of the delicate components
Re-strike	instantly	Need 8-10 minutes	Need 8-10 minutes	Need 8-10 minutes	fast
Environment	No mercury, no pollution	Scrap tube, heavy pollution	Scrap tube, heavy pollution	Mercury pollution	Mercury pollution

Comparison of LVD Lamps v/s LED

COMPARISON	LVD LAMPS	LED
Application	Industrial, Commercial, Roads, tunnels, bridges, gardens and parks, agricultural, advertising lighting.	Limited application in traffic signal, now being used for Indoor and outdoor lightings.
Technical Specification	<ol style="list-style-type: none">1. Wattage : 15W~300W2. Efficacy : >80 lm/W3. CRI : >80 Ra4. CCT : 2100K~6500K, all range.5. Lumen Depreciation : 5% @ 2000hrs.6. Lifetime : >100,000 hrs	<ol style="list-style-type: none">1. Wattage: 0.5W~1W per each.2. Efficacy : <60 lm/W (White LED)3. CRI : >80 Ra4. CCT : narrow range (White LED).5. Lumen Depreciation : >50% @ 2000hrs6. Lifetime : <50000 hrs.

7. Heat Output : much lower.

8. Fixture accommodated easily.

9. Linear light source:no glaring and flickering, better light quality.

7. Heat Output : much higher.

8. Fixture accommodated hardly because of heat-releasing design and reflector design.

9. Spot light source:glaring concern

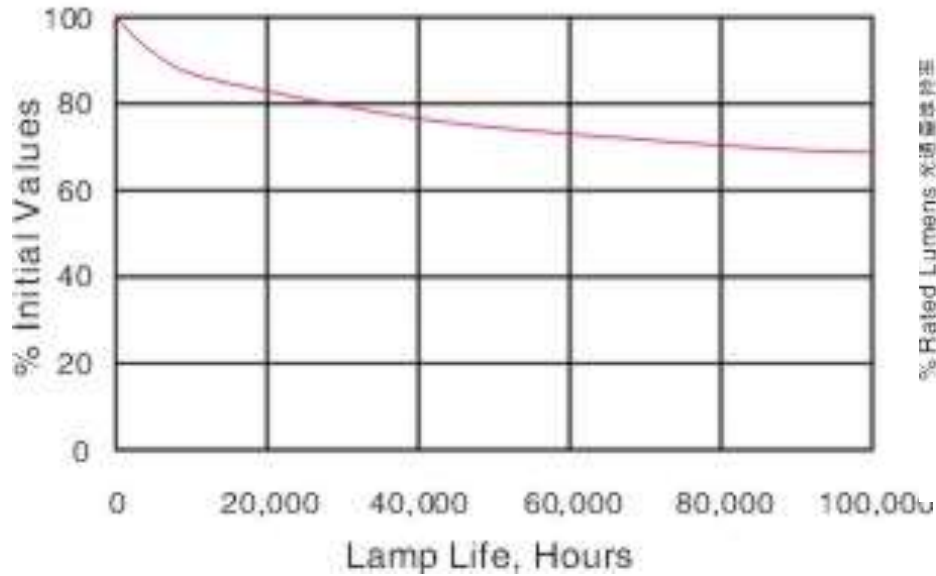
Energy-Savings

LVD lamps can save up to 50% of energy consumption than LED, because LVD lamps' efficacy is 30% higher than LED and lumen depreciation rate is much lower than LED.

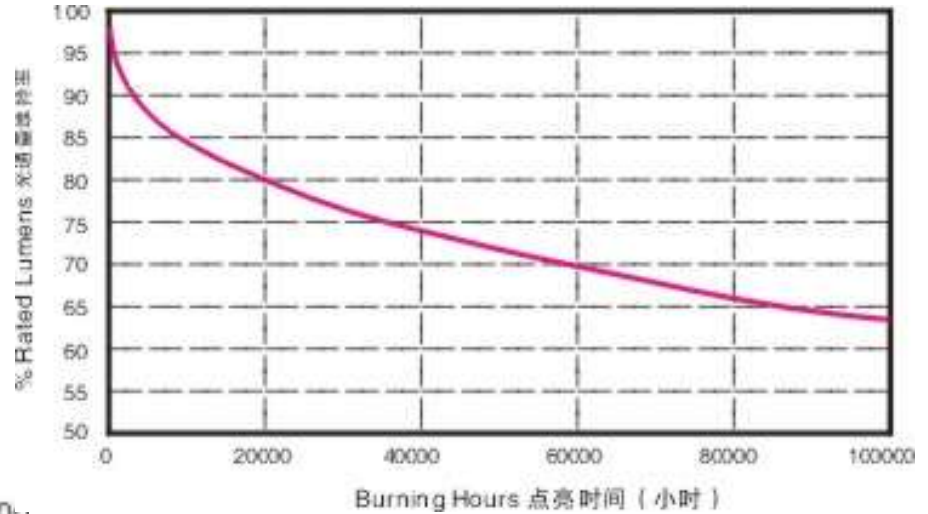
LED will consume much more energy than LVD lamps because of its lower efficacy, higher lumen depreciation rate.

40 W LVD Lumen Depreciation Test

Lumen Depreciation



200 W LVD Lumen Depreciation Test



Korea National Lighting Source Center

Measurements at Osram Munich 2003

Comparisons in real life

Shopping Mall Lighting



Item	Before	After
Light Source	150w Metal Halide Lamp	80w LVD Induction Lamp
Actual Power	170w	81w
Quantity	300pcs	300pcs
Saving Power	(170-81)w*300=26700w 26700*10h/1000=267kwh 10 hours for one day Save 96120kwh for one year Save 961200kwh for ten years	
Saving maintenance charge	300pcs Metal Halide Lamp working 10y	
Conclusion	High failure rate, low illumination, glare	Nice color output, soft light, Uniformity

Comparisons in real life

Factory & Warehouse Lighting



Item	Before	After
Light Source	400w Metal Halide Lamp	200w LVD Induction Lamp
Actual Power	460w	210w
Illumination	373Lux	510Lux
Work Life	8000h(about 1year)	100000h(about 10years)
Quantity	274pcs	274pcs
Saving Power	$(460-210)w \times 274 = 68500w$ $68500 \times 24h / 1000 = 1644kwh$ for one day Save 600000kwh for one year Save 6000000kwh for ten years	
Saving maintenance charge	274pcs Metal Halide Lamp working 10y	
Conclusion	Saving energy more than 50%, Illumination increased over 37%, the best model case for LVD application in industrial	

Comparisons in real life

Road Lighting

Light Source: 150w Sodium
Lamp(32.5 Lux)





Light Source: 80w LVD Induction
Lamp(44.8 Lux)



Apply LVD Induction Lamp Lighting System Annual Energy Consumption Saving is Kwh Annual Electricity Cost Saving

Energy Saving Effect Measurement Table of LVD Road Lighting Project (10Km)					
Comparison Item	Original Lighting System		Present Lighting System		
	Original Type and Specification	Quantity	Present Type and Specification	Quantity	
Lighting Source	HPS 250W	240	LVD 120W	90	
	Based on electricity rate in India Rs. 97200.00				
Electricity Cost	11,82,600.00		Rs. 38880.00		Rs./Month
			4,73,040.00		Rs./Year
Maintenance Cost	0		0		Rs./Year
Total	11,82,600.00		4,73,040.00		Rs./Year
Electricity & Maintenance Cost Saving			Rs. 7,09,560.00		Rs./Year
Energy Consumption	21,600		8640		Kwh/Month
	2,62,800		1,05,120		Kwh/Year
Energy Consumption Saving			1,57,680		Kwh/Year
Energy Consumption Saving in 10 Years			15,76,800		Kwh

PRICE LIST

Code	Description	Fixture PIX	NOTE	LVD Lamps Adopted	Lamp PIX	QTY	Lamp price (US\$/unit)	Fixture Price (US\$/unit)	Total Price (US\$/unit)	Total Price
0642	road light		for 10M high pole,	LL-120W			103	71	174	
			for 20m high pole	LL-200W			153	71	224	

NOTE

FOB Shanghai

Total Price in Rs. 8500.00 Each (120 W)

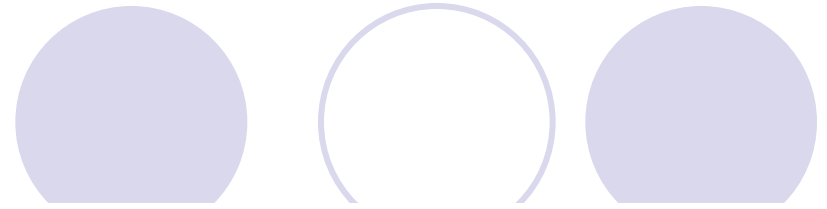
Total Energy Savings/Year = 1,57,680 Kwh

Total Energy Cost Savings = Rs. 7.10 Lacs

Expenditure on Replacement of 240 Fittings @ Rs. 8500/- each = Rs. 20.40 Lacs

Pay Back Period = 2.87 Years

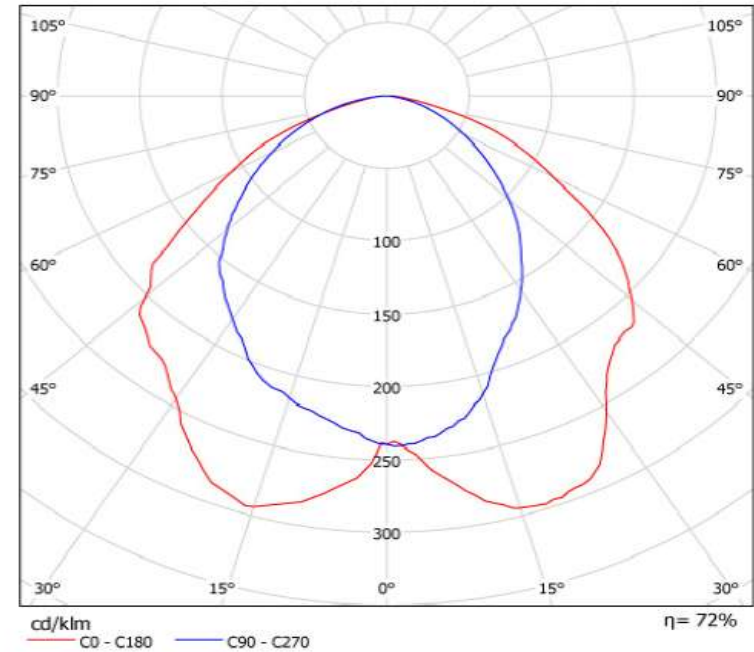
Luminaire Data Sheet



Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 50 83 97 100 72



Summary

- Increased consumption on energy and Increased temperature on the surface of our planet consequently threaten our lives in near future, let's work together to reduce emission of CO2 by improving energy efficiency!
- Start to save electricity in your life by using more energy-saving products like Hongyuan LVD



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Thanks for your attention!

