IEA Technology Collaboration Programme
Energy Efficient End-Use Equipment

Energy Efficiency in 4E Standards and Roadmaps

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IEC Motors-1

IEC ACEE — **ADVISORY COMMITTEE ON ENERGY EFFICIENCY**

(last meeting 19-21 April 2016 in Milwaukee, WI, USA), draft CD for review:
Guide 118:
«Energy Efficiency aspects inclusion in electrotechnical publications»,
Guide 119: "Preparation of the Energy Efficiency Publications and the use of Basic EE publications and Group EE publications".

IEC TC 2 — **ROTATING MACHINES**

(last meeting 16-20 May 2016 in Washington DC, USA)

- WG 12: Revision of IEC 60034-1: Performance, tolerance, rating plate: ► FDIS
- WG 28: Revision of IEC 60034-2-3: Converter fed motors: ►CDV
- WG 31: New IEC TS 60034-30-2: Efficiency classes for converter fed motors:► DTS

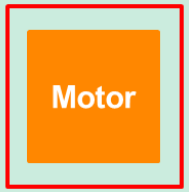
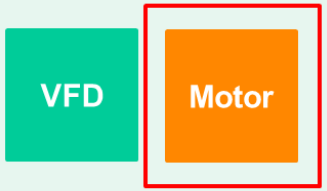
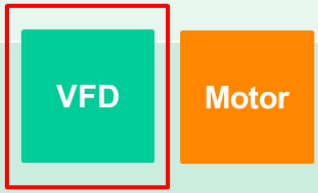
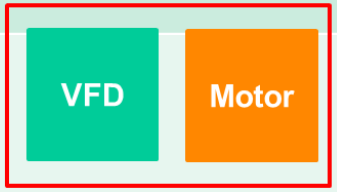
Next meeting: 13 October 2016 in Zurich, Switzerland

IEC SC22 G — **CONVERTERS & SYSTEM EFFICIENCY**

- WG 18: (last meeting 3 -5 November 2015, Brea, CA, USA)
  IEC 61800-9-1/IEC 61800-9-2 : ► FDIS
  Last meeting TF on Converter Testing: 13/14 October 2016 in Zurich,

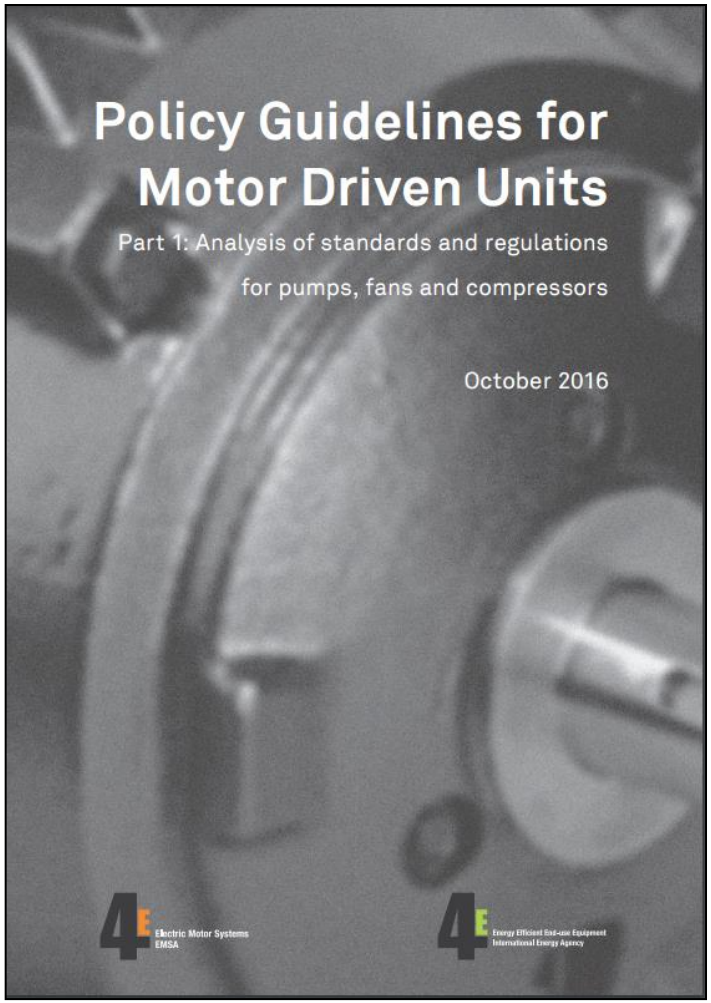
- **EMSA members in IEC**: A. Baghurst/Australia, C. U. Brunner/Switzerland, S. Nielsen/ Denmark

Motors-2

		Scope	Testing	Efficiency classification
1		motor	IEC 60034-2-1 **ed 2 published 2014**	IEC 60034-30-1 **ed 2 published 2014**
2		motor, driven by a VFD	IEC 60034-2-3 **ed 2 CD 2017**	IEC TS 60034-30-2 **Technical Specification spring of 2017**
3		VFD	IEC 61800-9 IEC 61800-9-1 Extended Products IEC 61800-9-2 VFD Classification/Testing **FDIS spring of 2017**	
4		Motor + VFD		

IEC = International Electrotechnical Commission VFD = variable frequency drive

Motors-3



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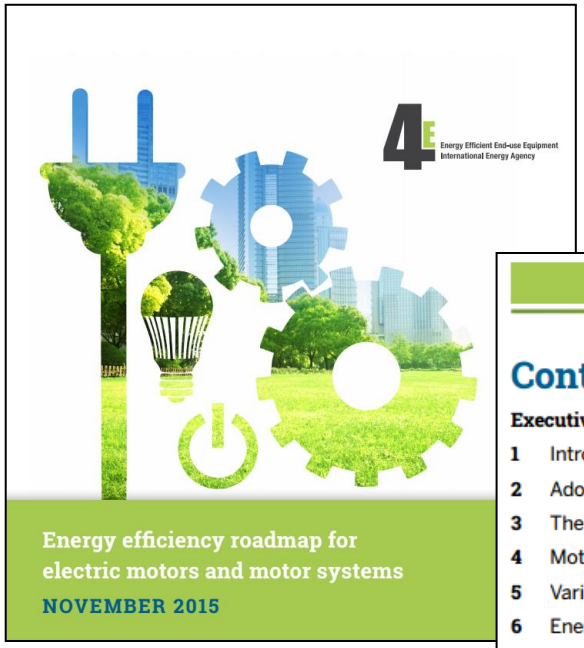
Energy Efficiency Roadmap for electric motors and motor systems.



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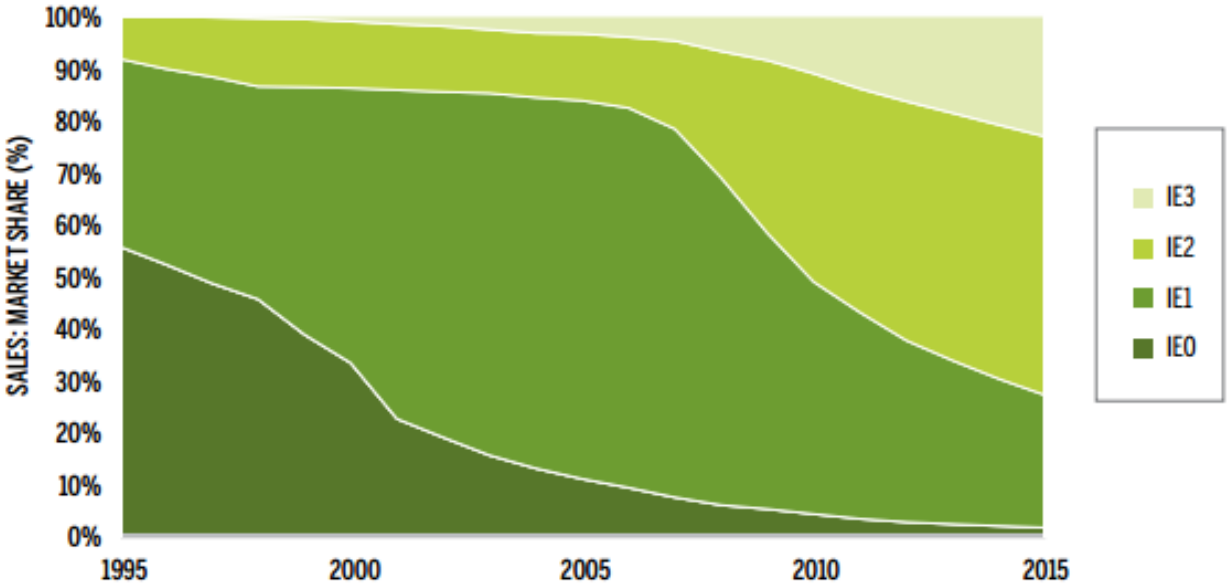
Energy Efficiency Roadmap for electric motors and motor systems.

Figure 1: Estimated global sales of motors by efficiency class, 1995-2015



Note: IE0 represents all motors below the IE1 level.
Source: [7]

Product Performance Tiers

Striving for high quality, energy efficient SSL products in your market? The IEA-4E SSL Annex has prepared voluntary quality and performance tiers to address product attributes such as colour, lifetime, power, and efficacy for common SSL applications. These product performance tiers are a limited number of proposed performance levels, agreed upon by IEA SSL Annex members, that could be utilised by government, non-profit and donor agencies when designing programmes and policies. The objective is to provide a limited number of levels that can be utilised by programme designers to reduce costs of writing specifications and to facilitate economic advantages for industry/trade. Further, they help minimise compliance costs with SSL programmes and policies. Member countries are not obligated to use the tiers, and they are not international standards.


Non-directional Lamps


Outdoor Lighting (Street Lighting)


Directional Lamps


High/Low Bay LED Luminaires

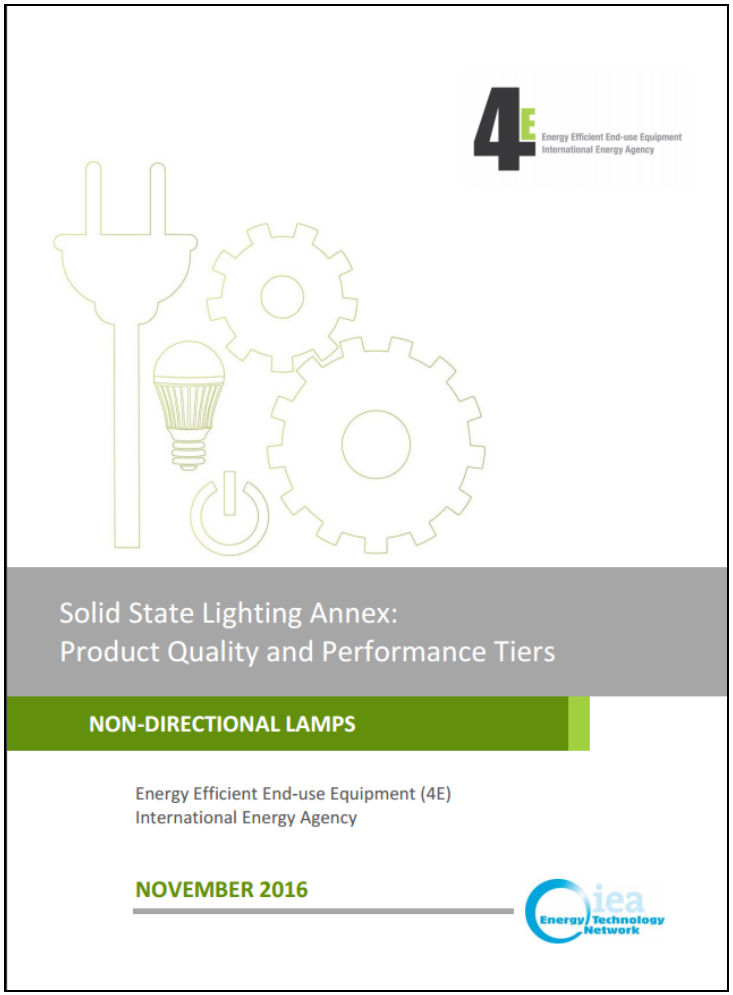

Downlight Luminaires


Planar Luminaires


Linear LED Lamps

XLS Spreadsheet for calculating Fourier Series (Dominant Light Modulation Frequency)

SSL-2


Energy Efficient End-use Equipment
International Energy Agency
Solid State Lighting Annex:
Product Quality and Performance Tiers
NON-DIRECTIONAL LAMPS
Energy Efficient End-use Equipment (4E)
International Energy Agency
NOVEMBER 2016
iea
Energy Technology Network

SSL-3

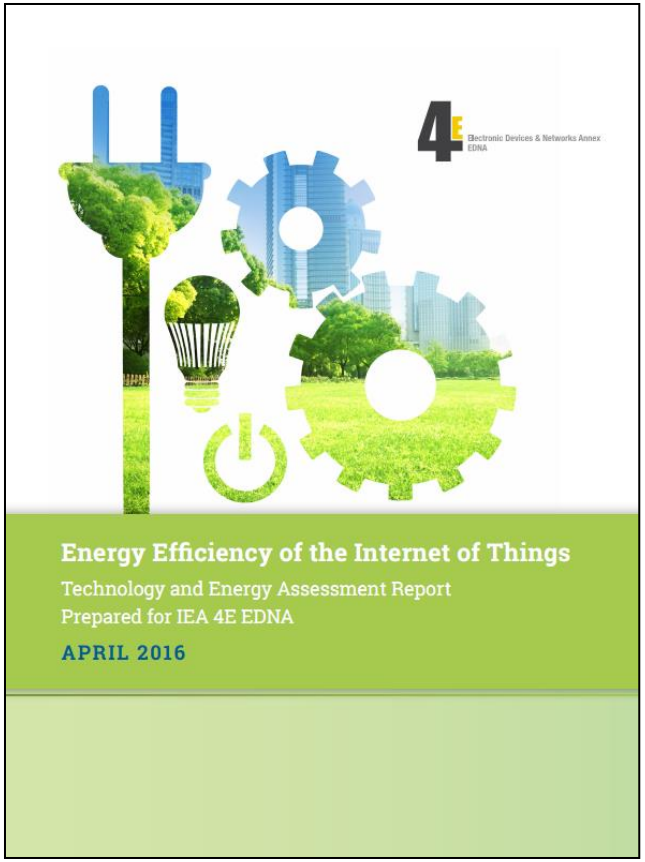
Table 1. IEA 4E SSL Annex Performance Tiers for Non-Directional Lamps

Note: please see Table 2 for recommended test methods for these parameters

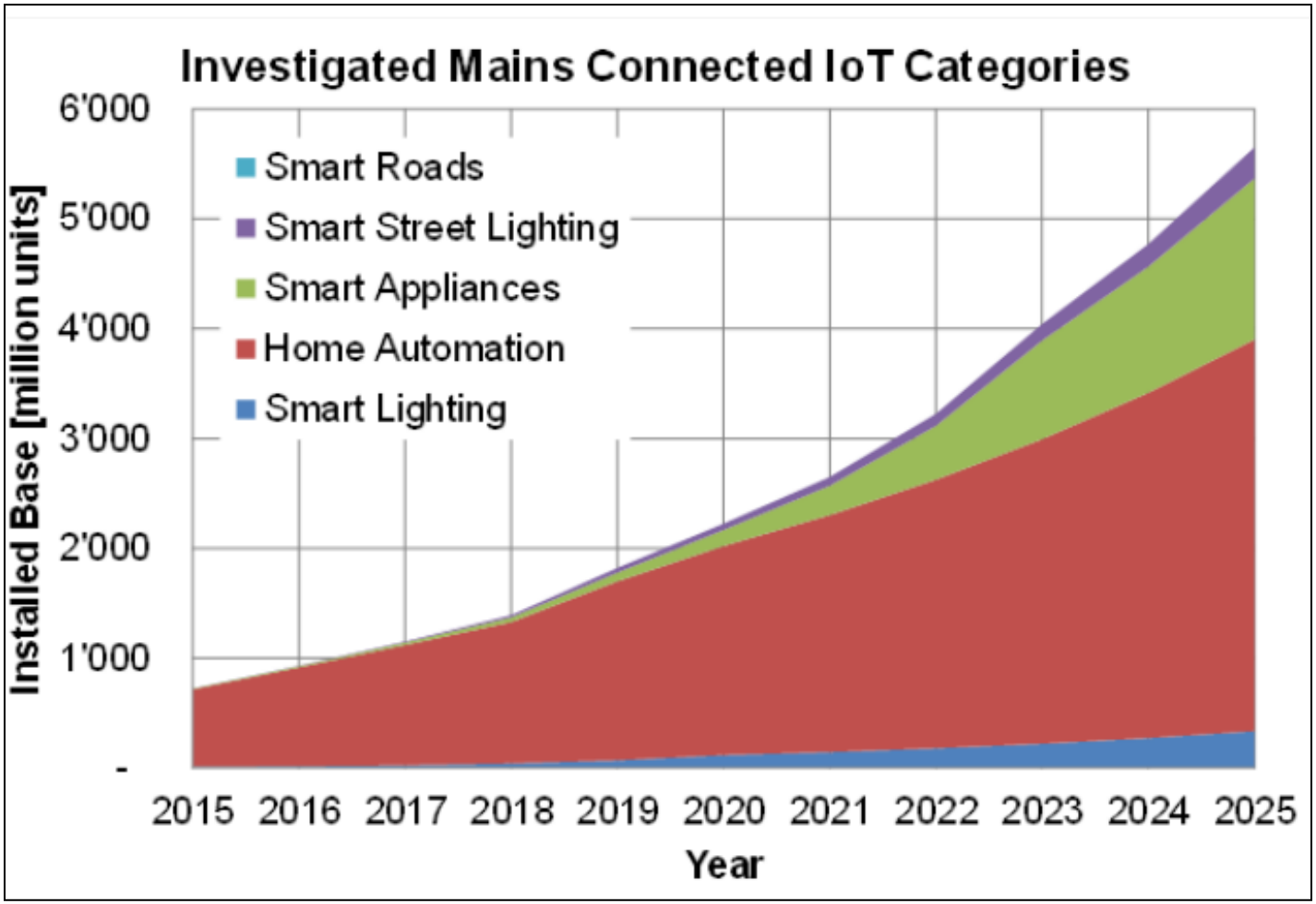
Parameter	Tier 1	Tier 2	Tier 3
Energy-Efficiency			
Minimum lamp luminous efficacy (lm/W)[1]	65 lm/W	90 lm/W	125 lm/W
Maximum Standby Power[2]	0.5 W	0.3 W	0.2 W
Claimed incandescent lamp wattage (W) equivalent based on initial light output (lumens)[3]	For 120V mains voltage products: Incandescent Wattage$_{120V}$ = [(lumens + 187) / 15.8] or For 230V mains voltage products: Incandescent Wattage$_{230V}$ = [(lumens + 176) / 13.9] or With the objective of moving away from voltage-dependent lumen bins, the table to the right offers incandescent wattage equivalency for the given set of		

Incancescent Wattage	Light Output
10 W	100 lm
15 W	150 lm
25 W	250 lm
30 W	350 lm
40 W	500 lm

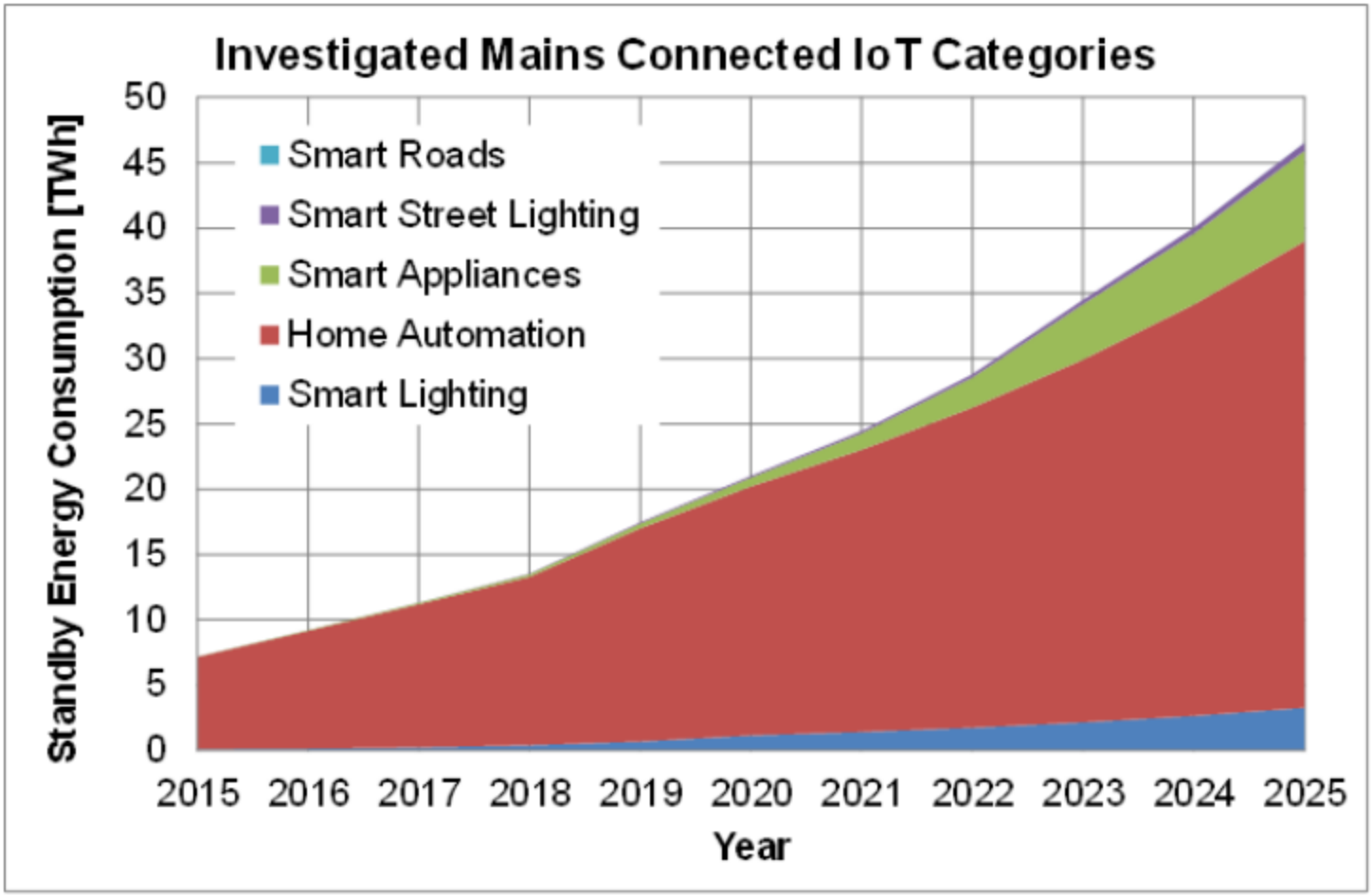
EDNA-1


Electronic Devices & Networks Annex
EDNA
Energy Efficiency of the Internet of Things
Technology and Energy Assessment Report
Prepared for IEA 4E EDNA
APRIL 2016

EDNA-2


Investigated Mains Connected IoT Categories
Installed Base [million units]
6'000
5'000
4'000
3'000
2'000
1'000
-
Smart Roads
Smart Street Lighting
Smart Appliances
Home Automation
Smart Lighting
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year

EDNA-3


Investigated Mains Connected IoT Categories
Standby Energy Consumption [TWh]
50
45
40
35
30
25
20
15
10
5
0
Smart Roads
Smart Street Lighting
Smart Appliances
Home Automation
Smart Lighting
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year

www.iea-4e.org

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