



Directorate of Energy Conservation  
Directorate General of New and Renewable Energy and Energy Conservation  
Ministry of Energy and Mineral Resources



# DATA & INFORMATION OF ENERGY CONSERVATION PROGRAM



## FOREWORD

This book contains information about energy conservation program achievements, and constituting as the first edition to be issued by the Directorate of Energy Conservation. Data and information that are contained in this book are taken until June 2016.

The energy demand in Indonesia continues to grow due to the increasing living standard and population growth. In 2015, energy consumption amounted to 886 million BOE, increased by 5.73% compared to 2014. To suppress the growth energy consumption, The Government through National Energy Policy (NEP or KEN) is committed to maintaining the achievement of energy intensity reduction targets by 1% per year until 2019. In order to promote energy efficiency in the user sectors (industry, buildings, transport, and households), the Government has also published several policies including the implementation of energy management system as well as energy audit, labelling of lighting equipment and AC (Air Conditioner), National Energy Efficiency Award (NEEA or PEEN), and socialization program and campaign on energy saving to public.

Jakarta,      October 2016

Energy Conservation Director

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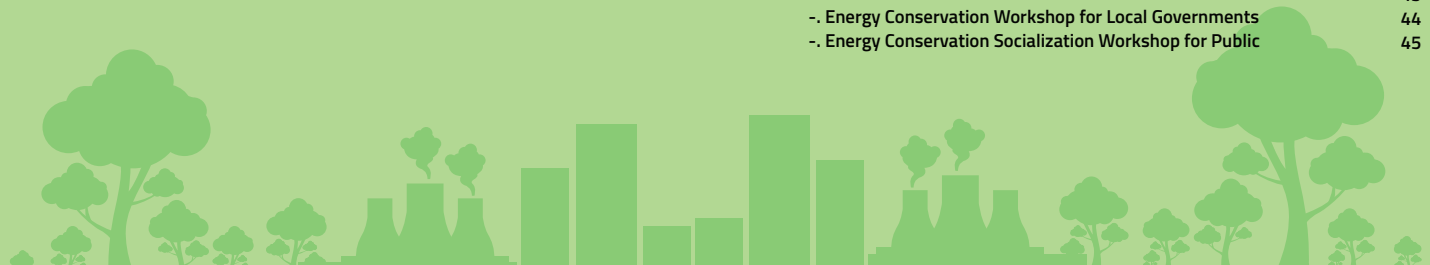
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# GLOSSARY

**Energy Audit:**

Energy utilization evaluation and energy saving potential identification process with the recommendation on energy efficiency enhancement for energy user as well as energy source user in the interest of energy conservation.

**Energy Auditor:**

An individual who performs energy audit. The individual has to own energy certification issued by certification agencies.

**Energy Conservation:**

Systematic, strategic, and integrated attempts in order to preserve domestic energy resources as well as increasing its utilization efficiency.

**Energy Conservation Index:**

Energy Conservation Index (ECI or IKE) is the ratio between energy consumption with unit of gross building area unit in a given period.

**Energy Elasticity:**

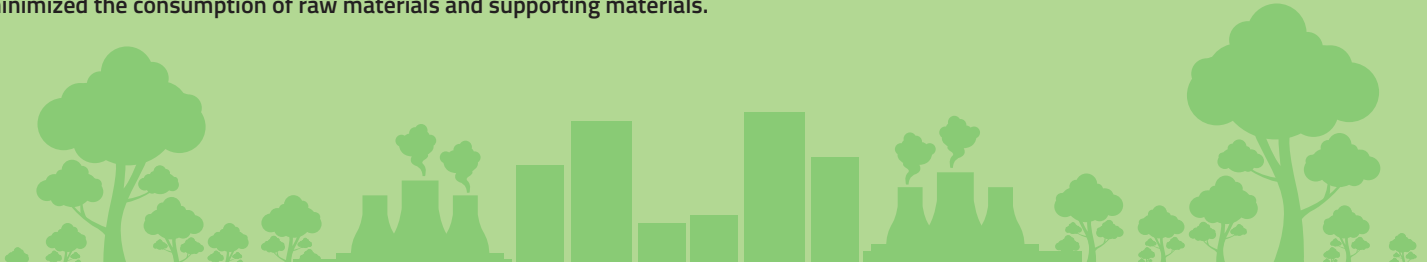
Energy demand growth which is necessary to achieve a certain economic growth rate (gross domestic product).

**Energy Intensity:**

Energy required to generate gross domestic product.

**Energy Management:**

Integrated activities to control energy consumption in order to achieve effective and efficient energy utilization to produce maximum output through technical measure in a structured and economical way to minimize the use of energy, including energy for production process and minimized the consumption of raw materials and supporting materials.





# GLOSSARY

**Energy Manager:**

An individual who is appointed to perform energy management.

**Energy Saving Labeling:**

Label is affixed to the equipment that utilizes electrical power for domestic use and other similar purposes which states that the specific product complies with energy saving requirements.

**ESCO (Energy Services Company)**

Activities of planning, implementation, operation and maintenance, as well as measurement and verification in the field of Energy Conservation.

**Final Energy:**

Energy which is utilized by end user such as electrical energy, gasoline, natural gas, LPG, coal, biodiesel, etc.

**Lamp Efficacy:**

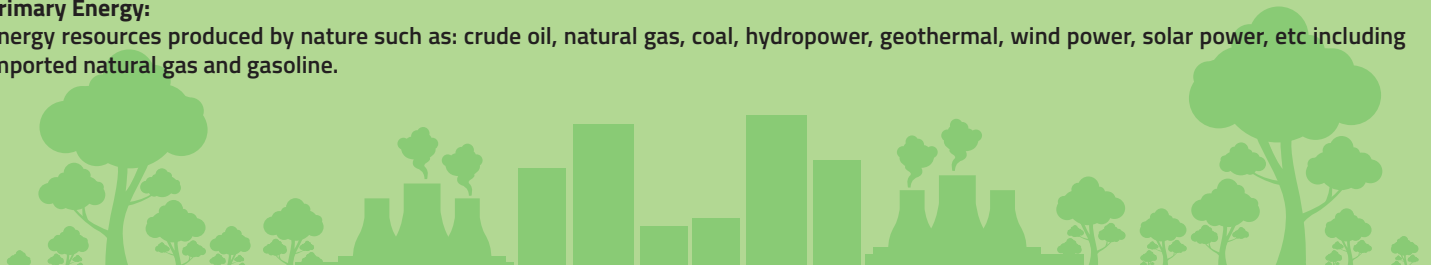
Often referred as luminous efficacy , is the efficiency level of energy conservation from electricity to light and expressed in lumen per watt as its unit.

**Minimum Energy Performance Standard (MEPS or SKEM)**

A specification which consists of a number of equipment performance requirements that effectively limits the maximum amount of energy that can be consumed by the equipment.

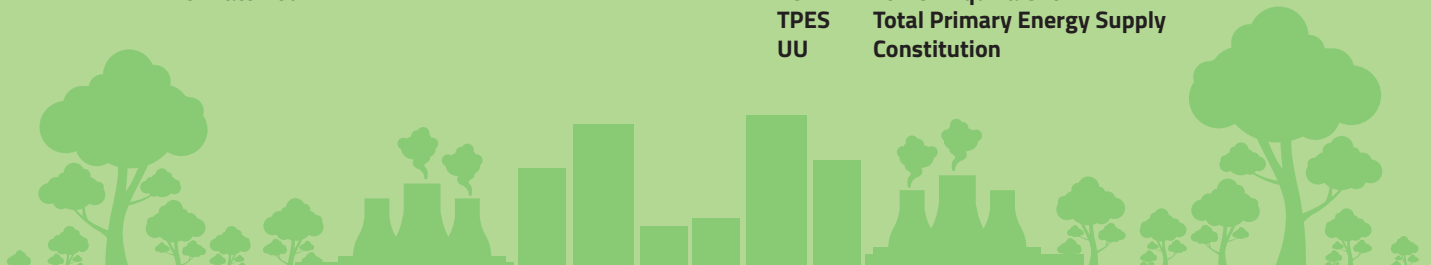
**Primary Energy:**

Energy resources produced by nature such as: crude oil, natural gas, coal, hydropower, geothermal, wind power, solar power, etc including imported natural gas and gasoline.



# LIST OF ABBREVIATIONS

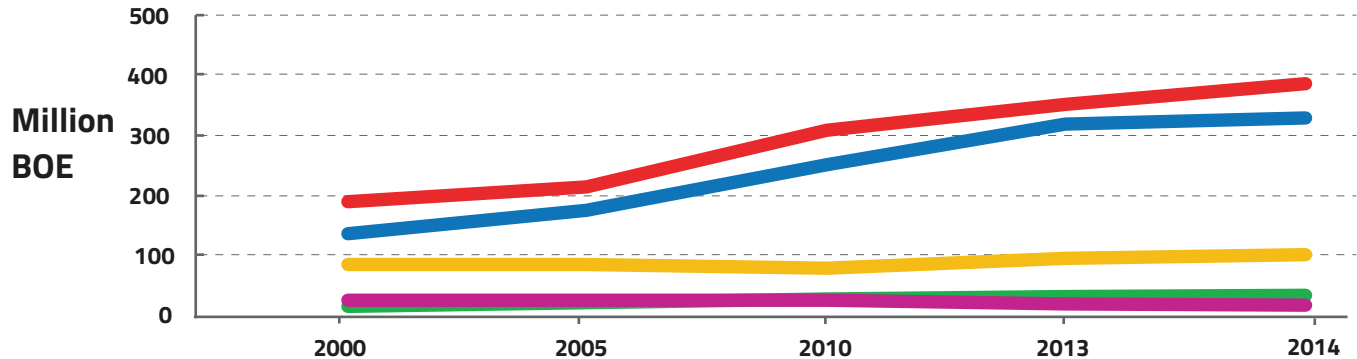
<b>SOB</b>	<b>State Owned Budget</b>	<b>PCA</b>	<b>Professional Certifying Agency</b>
<b>ASEAN</b>	<b>Association of Southeast Asian Nations</b>	<b>MEPS</b>	<b>Minimum Energy Performance Standard</b>
<b>CBS</b>	<b>Central Bureau of Statistic</b>	<b>MJ</b>	<b>Mega Joule</b>
<b>CFL</b>	<b>Compact Fluorescent Lamp</b>	<b>MTOE</b>	<b>Million Ton Oil Equivalent</b>
<b>CO2</b>	<b>Carbon Dioxide</b>	<b>MW</b>	<b>Mega Watt</b>
<b>FE</b>	<b>Final Energi</b>	<b>MWh</b>	<b>Mega Watt Hour</b>
<b>PE</b>	<b>Primary Energy</b>	<b>MR</b>	<b>Ministrial Regulation</b>
<b>ESCO</b>	<b>Energy Services Company</b>	<b>PDB</b>	<b>Gross Domestic Product</b>
<b>EMR</b>	<b>Energy and Mineral Resources</b>	<b>PR</b>	<b>Presidential Regulation</b>
<b>FED</b>	<b>Final Energy Demand</b>	<b>PJ</b>	<b>Peta Joule</b>
<b>GDP</b>	<b>Gross Domestic Product</b>	<b>SL</b>	<b>Street Lighting</b>
<b>GJ</b>	<b>Giga Joule</b>	<b>PLN</b>	<b>Perusahaan Listrik Negara</b>
<b>GHG</b>	<b>Green House Gases</b>	<b>GR</b>	<b>Governmental Regulation</b>
<b>GWh</b>	<b>Giga Watt Hour</b>	<b>LAP</b>	<b>Local Action Plan</b>
<b>HAKE</b>	<b>Himpunan Ahli Konservasi Energi</b>	<b>NAP</b>	<b>National Action Plan</b>
<b>IEA</b>	<b>International Energy Agency</b>	<b>MPEC</b>	<b>Master Plan for Energy Conservation</b>
<b>Inpres</b>	<b>Presidential instruction</b>	<b>GPNE</b>	<b>General Planning on National Energy</b>
<b>ISO</b>	<b>International Organization for Standardization</b>	<b>BOE</b>	<b>Barrel Oil Equivalent</b>
<b>NEP</b>	<b>National Energy Policy</b>	<b>INSOC</b>	<b>Indonesia's National Standard of Occupational Competence</b>
<b>MD</b>	<b>Ministrial Decree</b>	<b>SOP</b>	<b>Standard Operating Procedure</b>
<b>MEMR</b>	<b>Ministry of Energy and Mineral Resources</b>	<b>DLC</b>	<b>Domestic Local Content</b>
<b>MEF</b>	<b>Ministry of Environment and Forestry</b>	<b>TOE</b>	<b>Ton Oil Equivalent</b>
<b>KWh</b>	<b>Kilo Watt Hour</b>	<b>TPES</b>	<b>Total Primary Energy Supply</b>
		<b>UU</b>	<b>Constitution</b>



# 1 BACKGROUND



# FINAL ENERGY CONSUMPTION



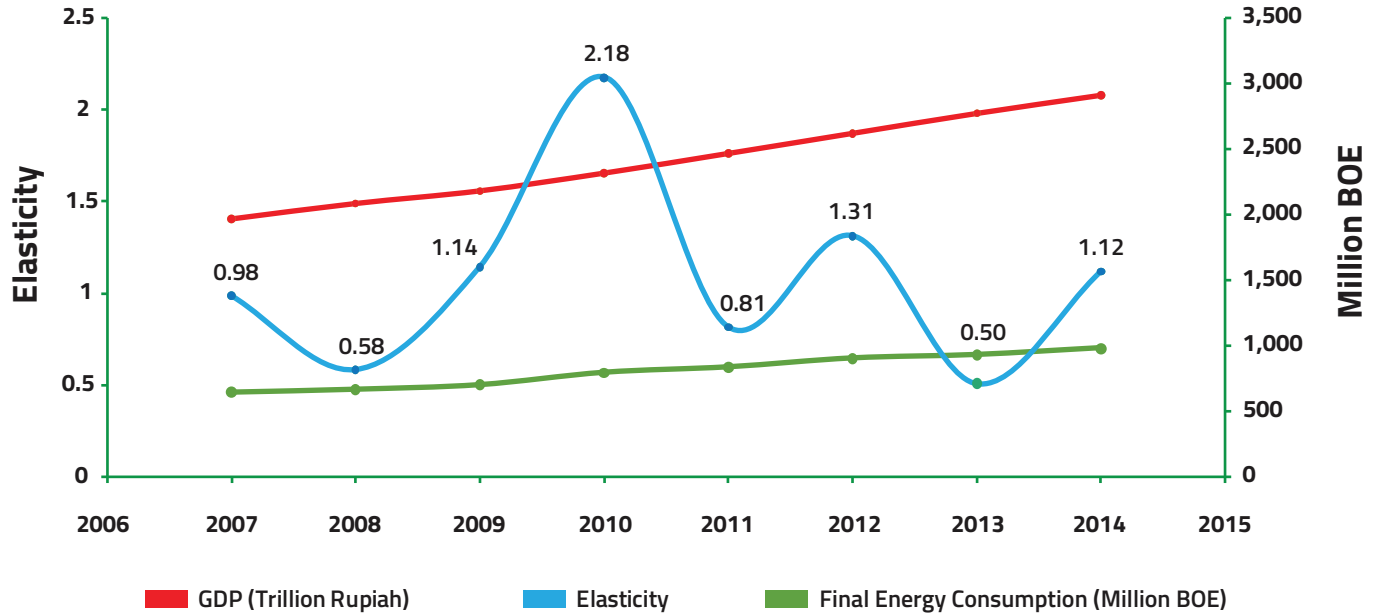
## Sector

<span style="color: red;">■</span> Industrial	193	218	312	355	388
<span style="color: blue;">■</span> Transportation	139	178	255	324	334
<span style="color: yellow;">■</span> Household	88	89	82	100	106
<span style="color: green;">■</span> Building/commercial	19	25	31	36	38
<span style="color: purple;">■</span> Others	29	29	28	23	20

## Notes

- Source: *Handbook of Energy & Economic Statistics of Indonesia 2015; Pusdatin ESDM*
- Excluding biomass and non-energy utilization

# FINAL ENERGY ELASTICITY

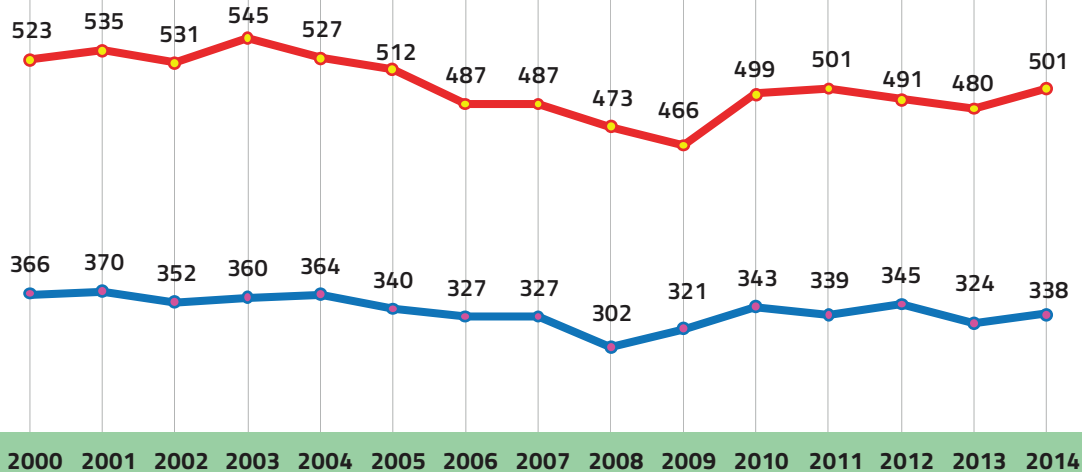


## Notes

• Source: *Handbook of Energy & Economic Statistics of Indonesia 2015*; Pusdatin ESDM

# ENERGY INTENSITY

**BOE/  
Billion Rupiah**



Primary Energy Intensity	523	535	531	545	527	512	487	487	473	466	499	501	491	480	501
Final Energy Intensity	366	370	352	360	364	340	327	327	302	321	343	339	345	334	338

**Notes**

• Source: *Handbook of Energy & Economic Statistics of Indonesia 2015*; Pusdatin ESDM

# ENERGY SAVING POTENTIAL

Sector	Sectoral Energy Consumption (Million BOE)*	Energy Saving Potential (%)	Sectoral Energy Saving Target **)
Industrial	355 (42%)	10–30	17%
Transportation	324 (39%)	15–35	20%
Household	100 (12%)	15–30	15%
Building	36 (4%)	10–30	15%
Others***	23 (3%)	25	

## Notes

\* Based on the *Handbook of Energy & Economic Statistics of Indonesia 2015*

\*\* Others consists of Agriculture, Construction, and Mining Sector

\*\*\* Year 2025

excluding biomass and non-energy utilization

Source: MEMR 2013

# ENERGY CONSERVATION ROADMAP

	UNIT	2010	2015	2020	2025	2030	2040	2050
FINAL ENERGY		748	-	-	-	-	-	-
HIGH SCENARIO (BAU)	Million BOE	-	1,100	1,613	2,162	2,859	4,471	6,011
LOW SCENARIO (EFFICIENT)	Million BOE	-	1,026	1,393	1,796	2,272	3,518	4,691
SAVING	Million BOE	-	73	220	367	586	953	1,319
	Percentage	-	7%	14%	17%	21%	21%	22%
FINAL ENERGY INTENSITY	BOE/ Billion Rp	344	325	296	258	229	181	134
ENERGY PER CAPITA	BOE/capita	3.15	4.10	5.35	6.60	8.14	11.80	15.25
CO <sub>2</sub> EMISSION REDUCTION POTENTIAL	Million Tonne	0	29.01	87.04	145.06	232.10	377.16	522.22

## Notes

- Decreasing energy intensity by 1% per year and energy elasticity less than 1 by 2050
- 17% of final energy saving by 2025

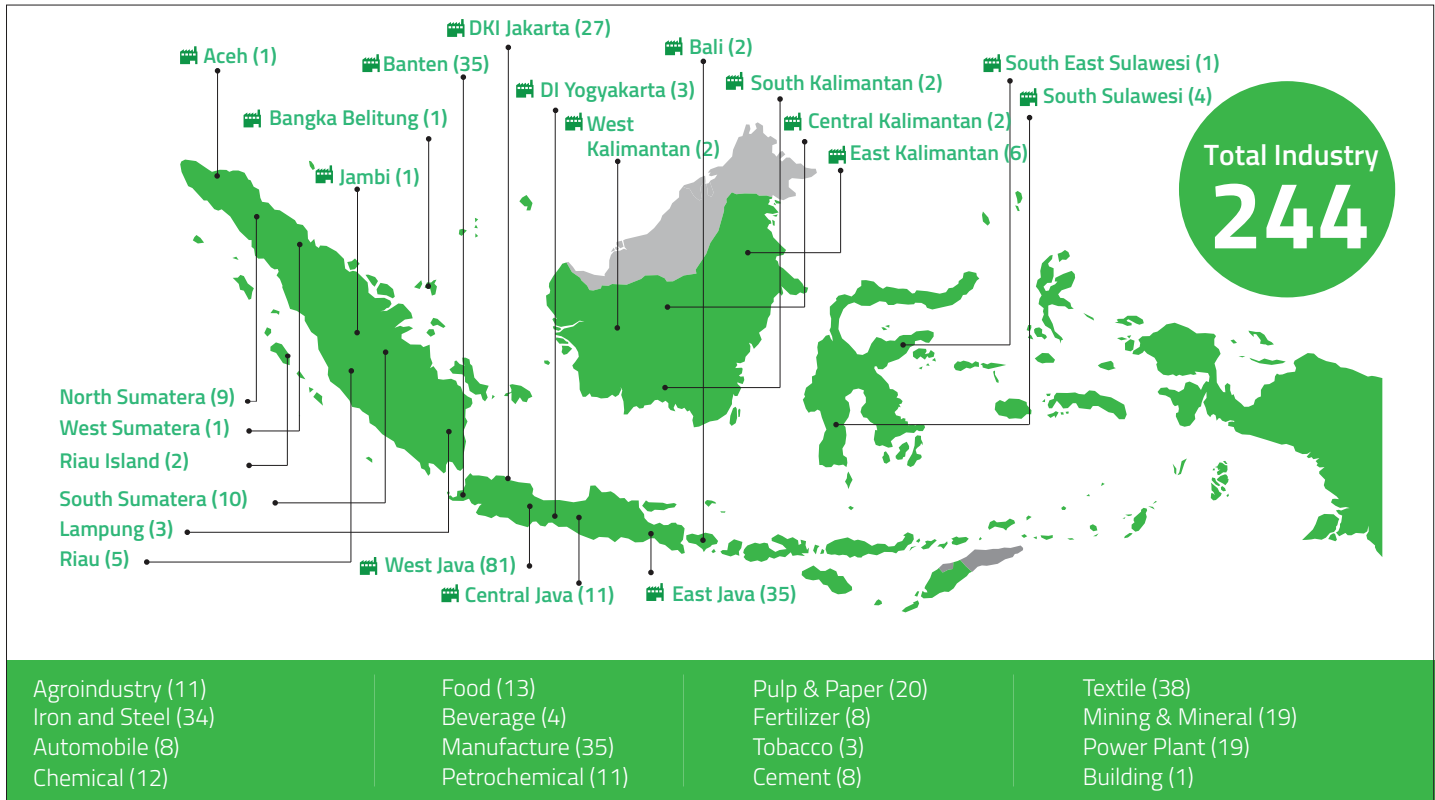
Source: MEMR 2013



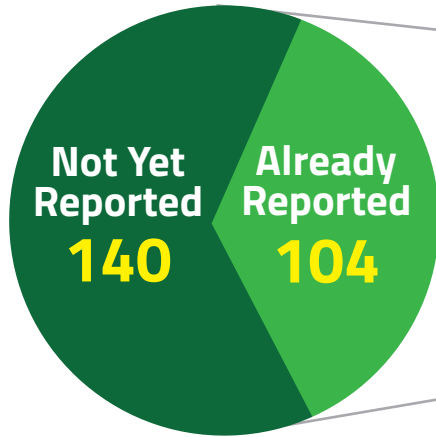
# 2 ENERGY MANAGEMENT



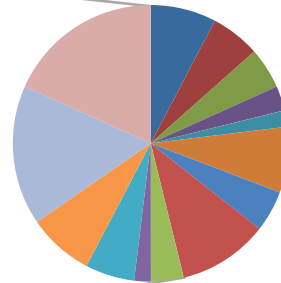
# DISTRIBUTION OF INDUSTRIES WITH ENERGY CONSUMPTION OVER 6,000 TOE



# REPORTING STATUS OF INDUSTRIES WITH ENERGY CONSUMPTION OVER 6,000 TOE



**TOTAL 244**



- Iron & Steel (8)
- Automobile (6)
- Chemical (5)
- Food (3)
- Beverage (2)
- Manufacture (8)
- Petrochemical (5)
- Pulp & Paper (11)
- Fertilizer (4)
- Tobacco (2)
- Cement (6)
- Textile (8)
- Mining & Mineral (17)
- Power Plant (19)

# ENERGY MANAGER AND AUDITOR



Energy Manager  
with Certificate  
of Competence



Total  
**288**



Energy Auditor  
with Certificate  
of Competence



Total  
**173**

2012

2013

2014

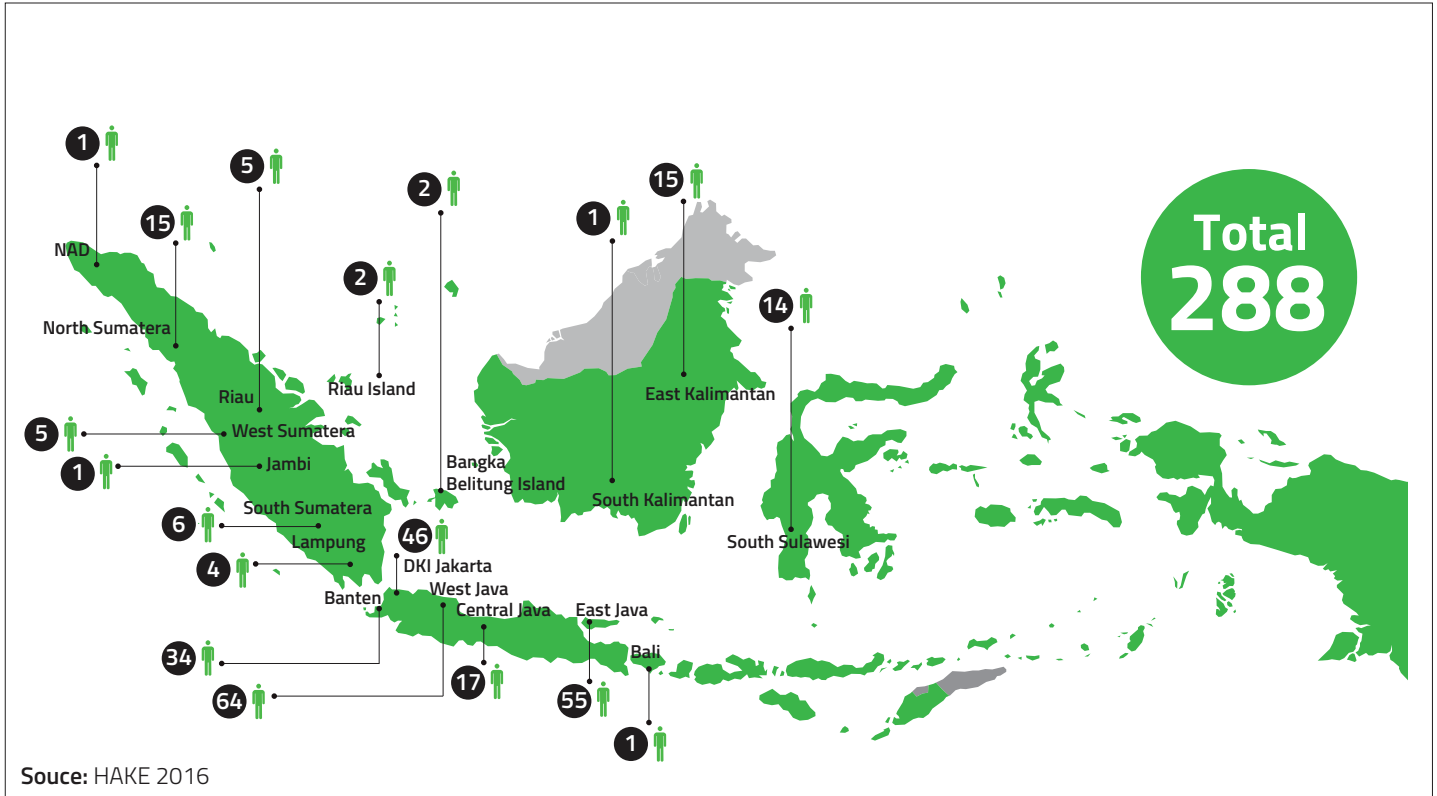
2015

2016

Energy Manager  
with Certificate  
of Competence

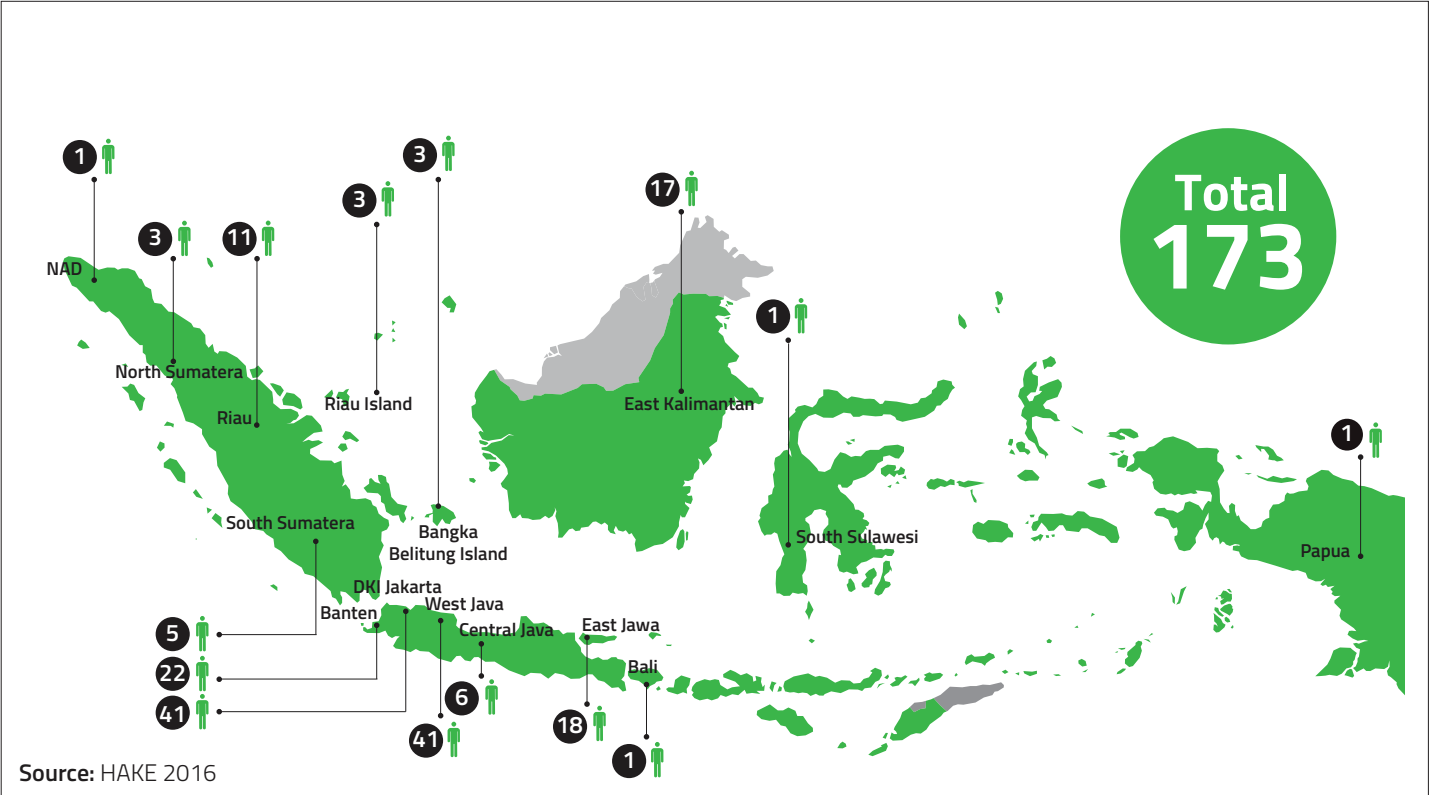


# DISTRIBUTION OF ENERGY MANAGER WITH CERTIFICATION OF COMPETENCE



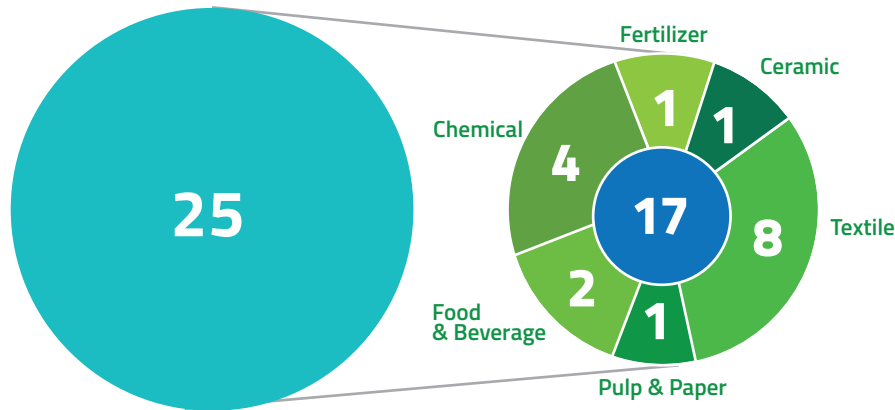
Source: HAKE 2016

# DISTRIBUTION OF ENERGY AUDITOR WITH CERTIFICATION OF COMPETENCE



Source: HAKE 2016

# ISO 50001 PILOT PROJECT: ENERGY MANAGEMENT SYSTEM IN INDUSTRY



- Total Industry (Target)
- Total Industry (Realization)

Saving  
**10 million**  
US Dollar

Emission Reduction  
**57.6 kilotonne**  
CO<sub>2</sub>/year

Energy Saving  
**170 GWh**

Source: UNIDO 2016

# ISO 50001 CERTIFICATION: ENERGY MANAGEMENT IN CORPORATION AND NATIONAL EXPERT

## LIST OF COMPANY WITH ISO 50001 CERTIFICATION

2013	2014	2015
<b>PT APAC Inti Corpora</b> Central Java Textile Industry	<b>PT KMK Global Sport</b> Banten Footwear Industry <b>PT Nippon Shokubai Indonesia</b> Banten Petrochemical Industry <b>PT Pertamina Hulu Energi ONWJ</b> DKI Jakarta Oil & Gas Industry <b>PT IKPP Tangerang</b> Banten Paper Industry <b>PT Indolakto</b> DKI Jakarta Food & Beverage Industry <b>PT Indonesia Power</b> DKI Jakarta Power Generation <b>PT Cingluh Indonesia</b> Banten Footwear Industry	<b>PT Clariant Indonesia</b> Banten Chemical Industry

## NATIONAL EXPERT FOR ISO 50001



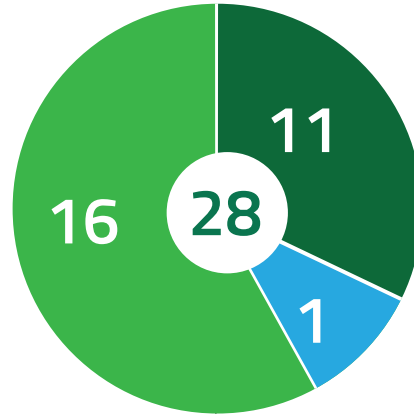
**38 PEOPLE**



# SYSTEM OPTIMIZATION

Total Pilot Company for System Optimization

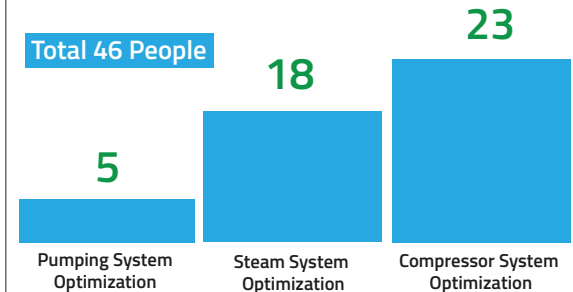
- Compressor System Optimization
- Steam System Optimization
- Pumping System Optimization



ISO 50001 Implementation

National Expert on System Optimization 2012-2017

Total 46 People



**CO<sub>2</sub> Emission Saving**  
631 kilotonne

**Cost Saving**  
4.9 Million US Dollar

**Energy Saving**  
1,016 GWh

- From the total of 104 recommendations, 48 energy efficiency activities have been implemented

# RESULT OF ENERGY CONSERVATION PARTNERSHIP PROGRAM IN 2011-2015



## PARTICIPANTS

**Industry  
Building**

	2011	2012	2013	2014	2015
Industry	125	104	108	180	0
Building	70	55	60	120	10



## SAVING POTENTIAL

**GWh  
Billion Rupiah  
kilotonne CO<sub>2</sub>**

GWh	837	1.532	556	515	4,1
Billion Rupiah	512	624	449	391	4.8
kilotonne CO <sub>2</sub>	646	1,380	500	463	3.38



## SAVING ACHIEVEMENTS

**GWh  
Billion Rupiah  
kilotonne CO<sub>2</sub>**

GWh	128	46	184	71	0
Billion Rupiah	82	60	184	34	0
kilotonne CO <sub>2</sub>	94	41.4	163	30	0



## INVESTMENT COST

**Billion Rupiah**

Billion Rupiah	405	391	95	191	5
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**TOTAL OBJECT**

**832**

# INVESTMENT GRADE AUDIT (IGA) IN INDUSTRIAL SECTOR



IGA  
10 COMPANIES



SAVING POTENTIAL  
**43.6** GWh/Year

**158.81** Billion IDR



SAVING POTENTIAL  
**64.5** GWh/Year

**49.01** Billion IDR



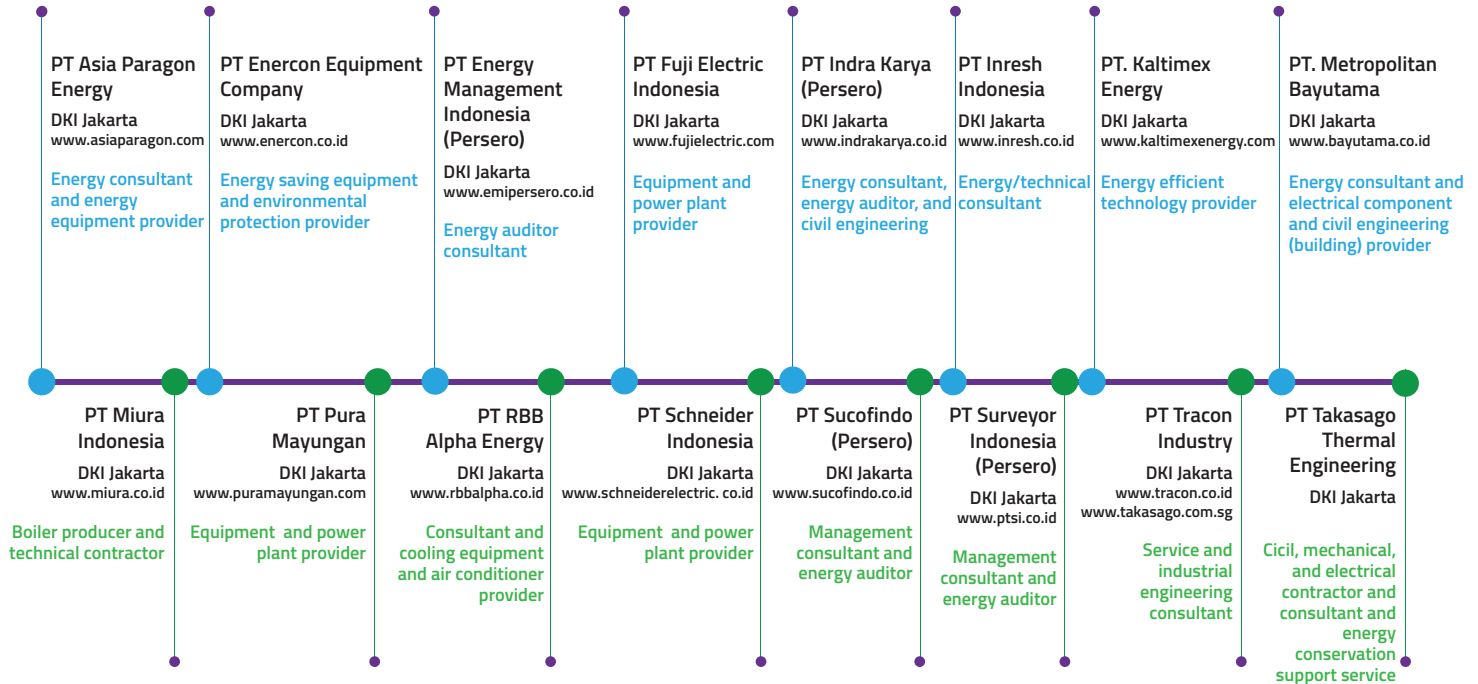
SAVING POTENTIAL  
**3.5** GWh/Year

**34.54** Billion IDR

## Notes

- IGA activities started in 2014

# LIST OF ENERGY CONSERVATION SUPPORT SERVICE COMPANY IN INDONESIA

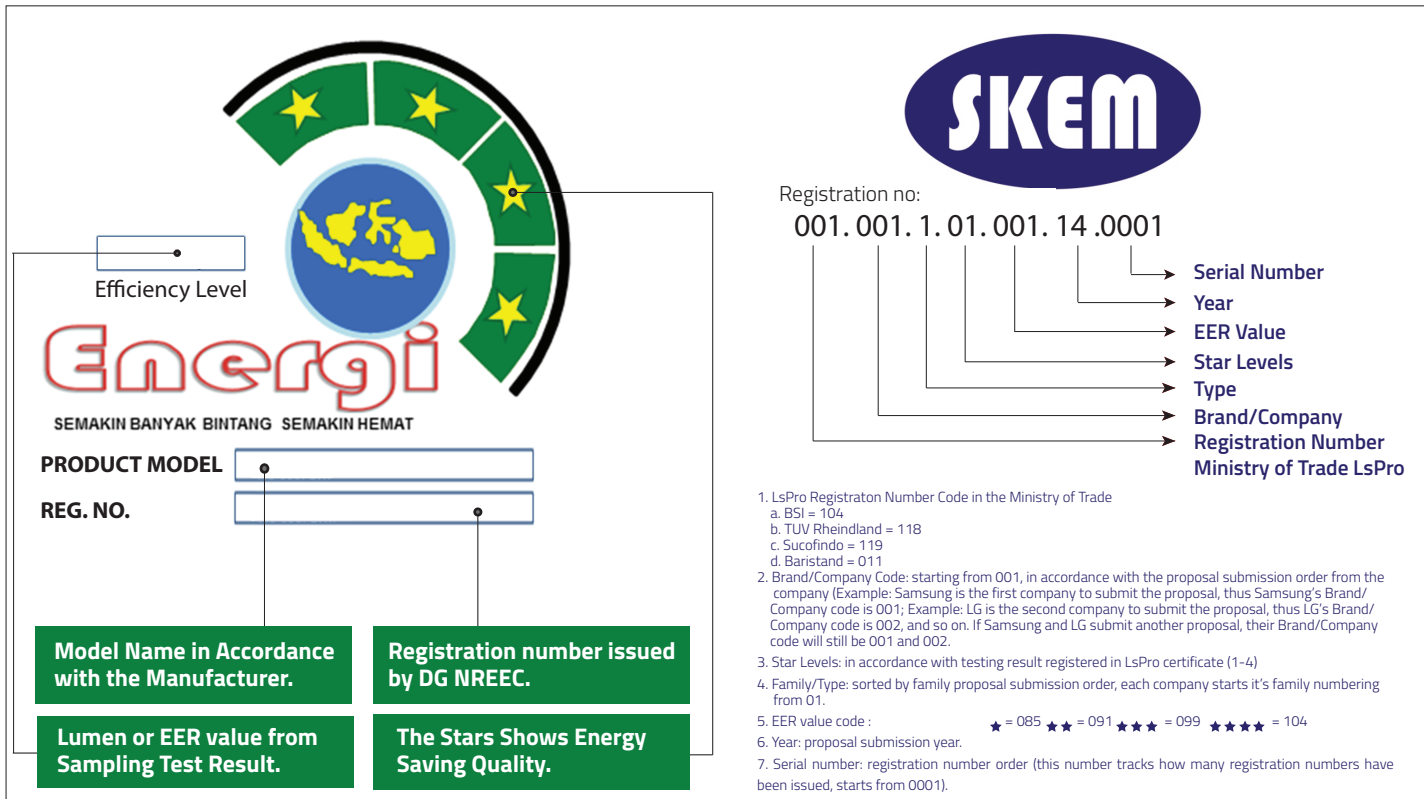


Source: Apkenindo

# 3 ENERGY SAVING EQUIPMENT STANDARD AND LABEL



# ATTACHMENT OF MINIMUM ENERGY PERFORMANCE STANDARD (SKEM) AND ENERGY SAVING LABEL

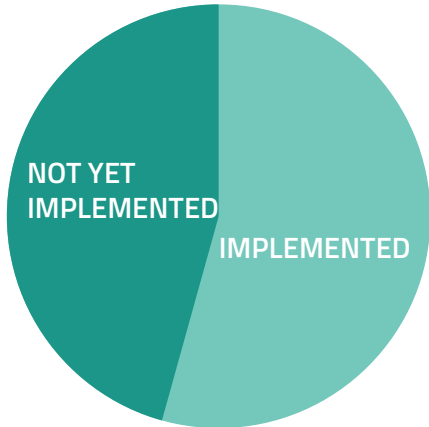


# ENERGY SAVING LABEL CRITERIA

Efficacy Value ( Lumen/Watt )								
Power (Watt)	2,700 K up to < 4,400 K*				4,400 K up to < 6,500 K			
	★	★★	★★★	★★★★	★	★★	★★★	★★★★
≤ 8	< 34	≤ 34	≤ 44	≤ 54	< 33	≥ 33	≥ 42	≥ 51
> 8-15	> 38	≤ 38	≤ 48	≥ 48	< 37	≥ 37	≥ 46	≥ 55
> 15-25	> 42	≥ 42	≥ 52	≥ 62	< 41	≥ 41	≥ 50	≥ 59
> 25-60	> 46	≥ 46	≥ 56	≥ 56	< 45	≥ 45	≥ 54	≥ 63

\*K=Kelvin

# COMPANIES WITH PERMIT TO AFFIX ENERGY SAVING LABEL



NOT YET IMPLEMENTED LABELING **17**

IMPLEMENTED LABELING **18**

**TOTAL** **35**

Company Type	Total Product
Producer	37,544,281
Importer	38,571,440
<b>Total</b>	<b>76,115,721</b>

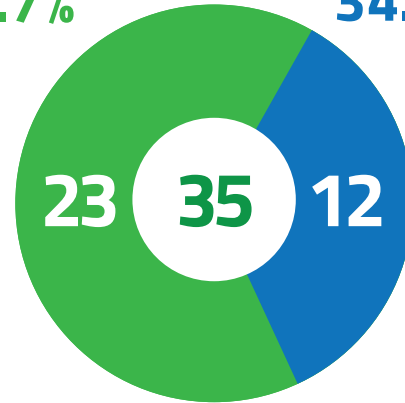


# DISTRIBUTION OF ENERGY EFFICIENT LIGHTING COMPANY



Total importer  
**65.7%**

Total producer  
**34.3%**

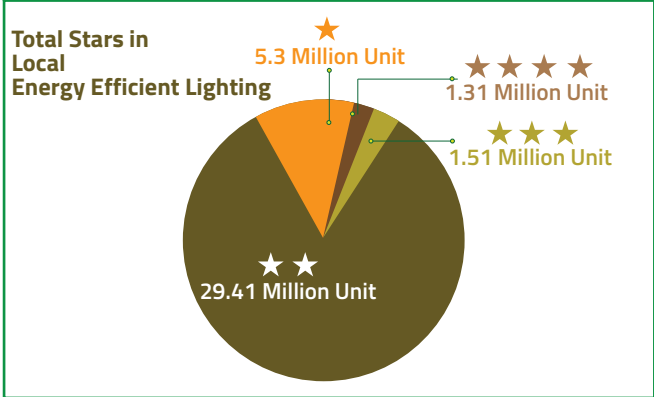
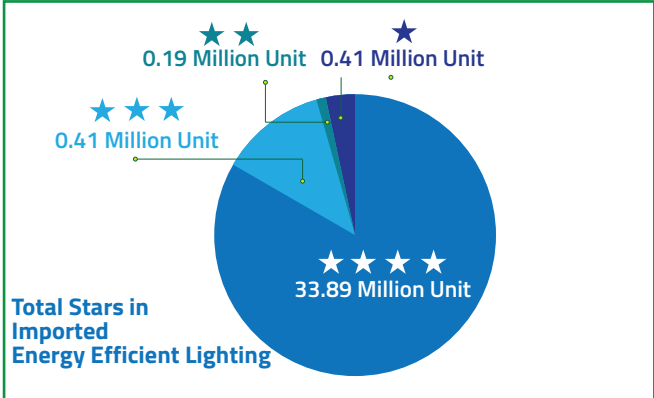
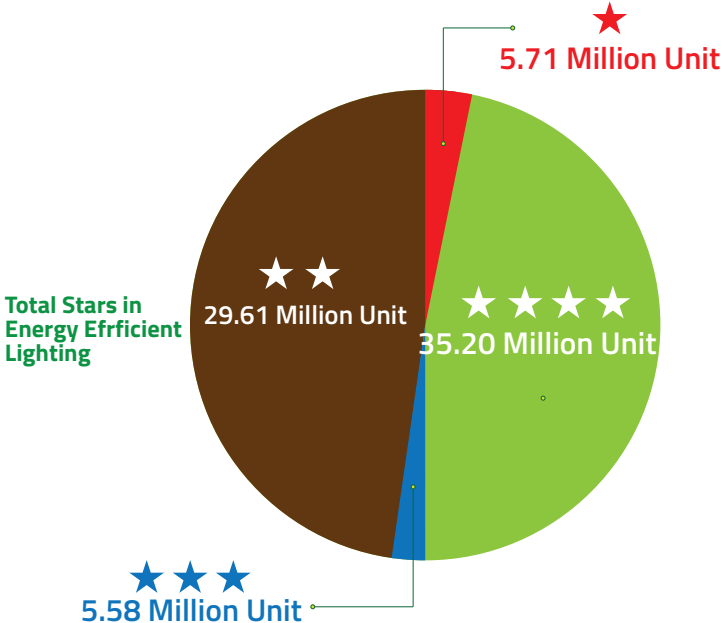


Energy Efficient Lighting Company

 **Total 35**  
Energy Efficient  
Lighting Companies

Source: Aperlindo 2016 & NREEC

# LIGHTING MARKET SHARE BASED ON ENERGY SAVING LEVEL



# TESTING LABORATORY PROFILE FOR ENERGY EFFICIENT LIGHTING

Laboratorium	Alamat
<b>P3TKEBTKE</b> Jakarta	Jl. Cileduk Raya Kav. 109, Cipulir Kebayoran lama Jakarta 12230 Telp: 021-7203530 Fax: 021-7203525
<b>B2TKE - BPPT</b> Serpong	Kawasan Puspitex Gd.620-622 Serpong, Tangerang - Banten Telp: 021-7560550, 7560092 Fax: 021-7560904
<b>BARISTAND</b> Surabaya	Jl. Jagir Wonokromo No. 360, Surabaya 60244 Telp: 031-8410054 Fax: 031-8410480
<b>PT SUCOFINDO</b> Bekasi	Jl. Arteri Tol Cibitung, Bekasi 17520 Telp: 021-88321176 Fax: 021-88321166
<b>B4T</b> Bandung	Jl. Sangkuriang No.14, Bandung 40135 Telp: 022-2504088, 2504828, 2510682 Fax: 021-2502027

**B2TKE-BPPT**  
Energy Technology Main Station  
Efficacy Test Capacity:  
**500** Lamp /month

**BARISTAND**  
Research and Standardization Station  
Efficacy Test Capacity:  
**800** Lamp /month

**B4T**  
Engineering Equipment and  
Material Main Station  
Efficacy Test Capacity:  
**600** Lamp /month

**PT SUCOFINDO**  
Efficacy Test Capacity:  
**2,280** Lamp /month

**P3TKEBTKE**  
Research and Technology  
Development Center in  
Electricity, New & Renewable  
Energy, and Energy  
Conservation  
Efficacy Test Capacity:  
**300** Lamp /month

# PICK TEST LOCATION FOR ENERGY SAVING LABEL SUPERVISION

## 2014

- DI Yogyakarta: Yogyakarta
- West Java: Bandung
- Central Java: Semarang
- South Kalimantan: Banjarmasin
- East Java: Surabaya
- Bali: Denpasar

## 2015

- North Sulawesi: Manado
- Central Java: Solo
- North Sumatera: Medan
- Banten: Tangerang
- West Java: Cirebon, Bogor, Bekasi
- Bali: Denpasar
- DI Yogyakarta: Yogyakarta
- Riau Island: Batam

## 2016

- NAD: Banda Aceh
- East Jawa: Malang
- South East Sulawesi: Kendari
- North Kalimantan: Balikpapan
- South Sulawesi: Palu

Total Pick Test

### Total Sample

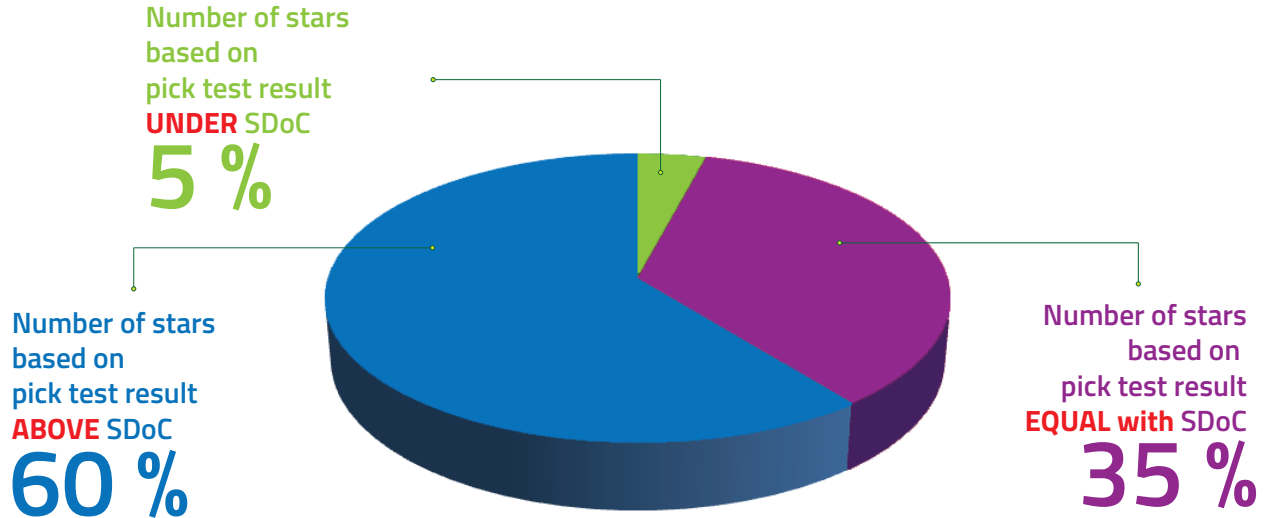
2014	640
2015	1,060
2016	240



### Total Location

2014	6
2015	10
2016	5

# INFORMATION ON STARS AND PICK TEST RESULT EFFICACY CONFORMANCES



- Pick test efficacy value DOES NOT EXCEED an acceptance tolerance of 20% in accordance with EMR Minister Regulation No. 18/2014, Article 12 paragraph 3 letter g

# SKEM AND ENERGY SAVING LABEL FOR AIR CONDITIONING DEVICES



Minimum efficiency allowed in SKEM requirement is **EER 8.53**



**EER 12,50**  
Tingkat Hemat

**Energi**

## ENERGY SAVING LABEL CRITERIA

★	8.53 < EER < 9.01
★★	9.01 < EER < 9.96
★★★	9.96 < EER < 10.41
★★★★	10.41 < EER

SEMAKIN BANYAK BINTANG SEMAKIN HEMAT

MODEL: UNIT DALAM	AC-095FLWi		
UNIT LUAR	AC-095FLWk		
DAYA	720 W	KAPASITAS PENDINGINAN	9000 BTU/h
NO. REGISTER	01.1.1.12,50.4.15.01		

- Notes
- EER is the ratio between cooling capacity (BTU/hour) and electrical power consumption (Watt)  
EMR Minister Regulation No.7/2015 concerning SKEM and energy saving label for air conditioning devices

# PRODUCT CERTIFICATION AGENCIES FOR AIR CONDITIONING DEVICES

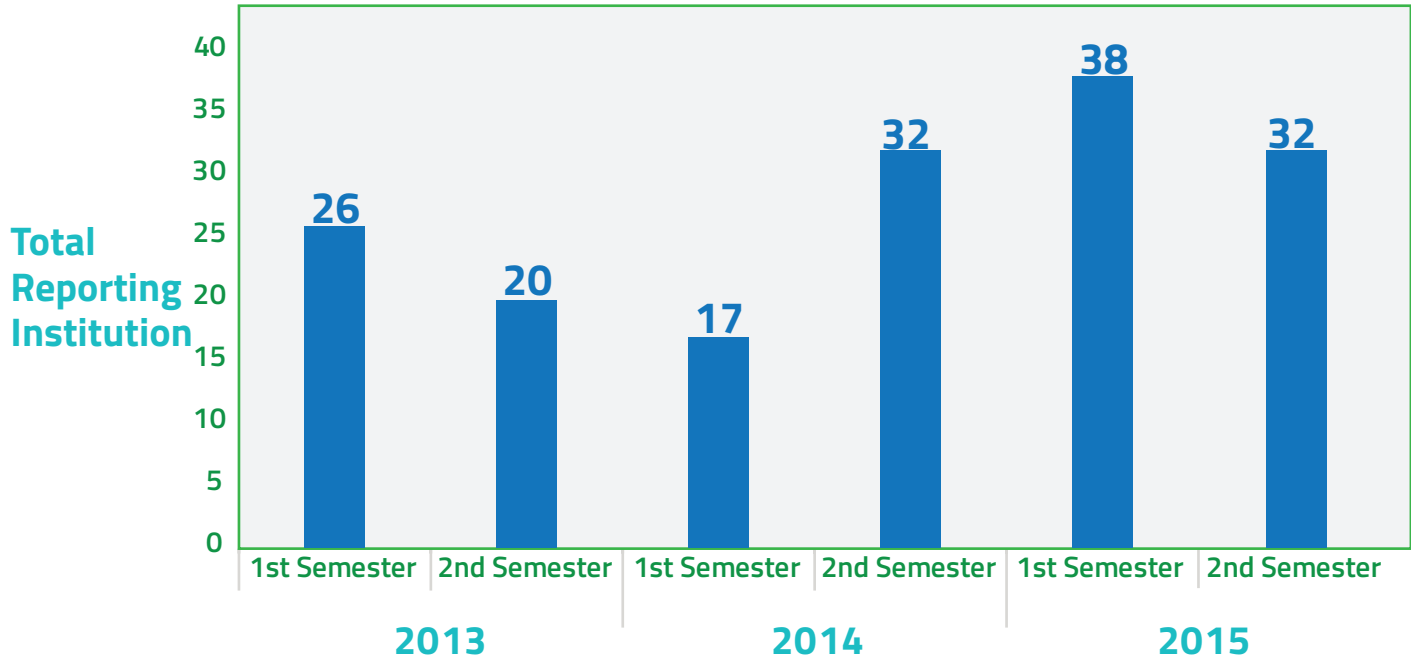
No	Name	Address
1	Industrial (Baristand) Surabaya	Jl. Jagir Wonokromo 360 Surabaya 60244 Tel: 031-8410054 Fax: 031-8410480
2	Industrial Certification Station	Jl. Cikini IV No.5 Jakarta Pusat 10330 Tel: 021-31925807, 31925808 Fax: 021-31925806, 31925805
3	TUV Reinland	Infinia Park Blok B92-93 Jl. Dr. Saharjo No.45 Jakarta 12850 Tel: 021-83795571 Fax: 021-83795572
4	PT SUCOFINDO (Persero)	Graha Sucofindo B1 Floor Jl. Raya Pasar Minggu Kav. 34 Jakarta 12780 Tel: 021-7983666 ext. 2062, 2605, 2614 Fax: 021-7987015

# 4 ENERGY CONSERVATION IN PUBLIC SECTOR

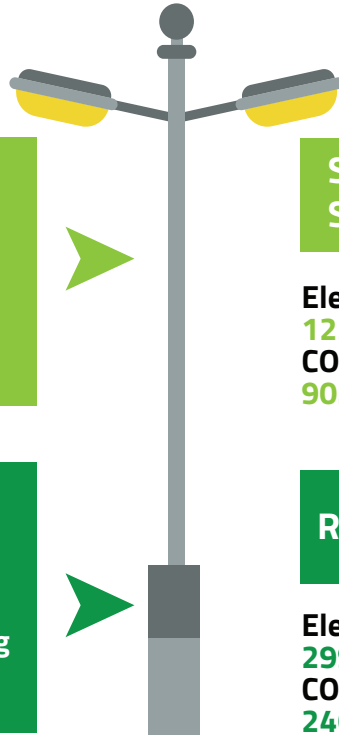




## GOVERNMENTAL INSTITUTION REPORTING ON ENERGY AND WATER SAVING



# ENERGY EFFICIENT STREET LIGHTING INSTALLATION 2014-2015



**480**  
Points

Sumba Street Lighting,  
Using LED light bulb  
and Solar Energy

**190**  
Points

Aceh Street Lighting,  
Using LED light bulb  
and Solar Energy

**257**  
Points

Batang Street Lighting,  
LED Retrofitted

**259**  
Points

Semarang Street Lighting  
LED Retrofitted

## SOLAR POWERED STREET LIGHTING

Electricity Saving

123,775 kWh

CO<sub>2</sub> Emission Reduction

90.87 Ton CO<sub>2</sub>

**670**  
points

## RETROFITTED STREET LIGHTING

Electricity Saving

299,658 kWh

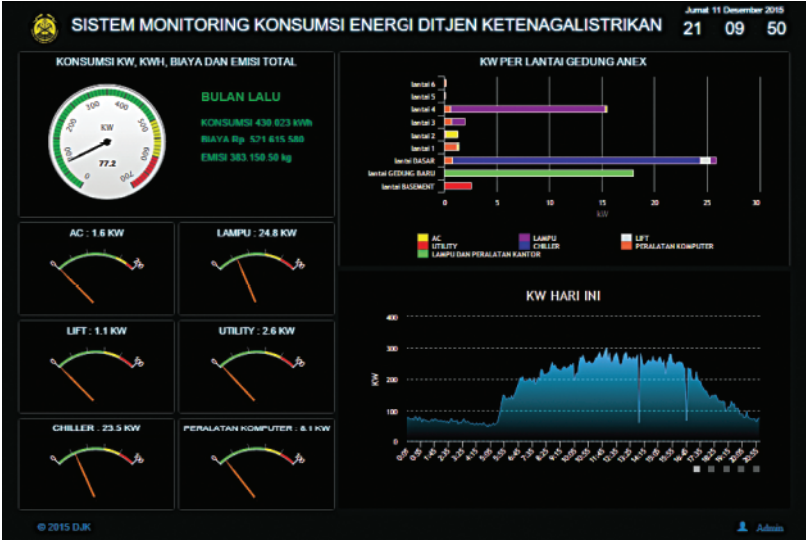
CO<sub>2</sub> Emission Reduction

246.62 Ton CO<sub>2</sub>

**516**  
titik

# ENERGY MONITORING SYSTEM IN BUILDING INSTALLATIONS

**Total Saving  
33,016.43 kWh  
or Rp 135.55 Million**



# 5 SOCIALIZATION



# ENERGY CONSERVATION SOCIALIZATION ACTIVITIES



**Energy Conservation Implementation Workshop for Local Governments**



**Energy Conservation Socialization through Public Service Announcements and Talkshows in National TV**



**Exhibition**



**Energy Conservation Outreach/Socialization**



**Digital Campaign through Internet**



**Energy Conservation Socialization in Elementary Schools**



**Public Service Announcement Broadcast in Digital Media, Trains, and Aeroplanes**



**Energy Conservation Socialization in Print Media and Radio**



**Energy Saving Competition in Households and Schools (middle and high)**



# NATIONAL ENERGY EFFICIENCY AWARDS (NEEA OR PEEN)



## A. Energy Efficient Building Category

- New Building
- Retrofitted Building
- Tropical Building
- Special Innovation
- Green Building
  - Small and Medium
  - Large

## B. Energy Management in Industry and Building Category

- Building (Small and Medium)
- Building (Large)
- Industry (Small and Medium)
- Industry (Large)
- Special Innovation (Industry)
- Special Innovation (Building)

## C. Energy and Water Saving in Governmental Institution Category

- Central Government Institution (Ministry /Institution)
- Local Government Institution

# ASEAN ENERGY AWARDS (AEA)



\* Notes:

AEA Participants from Indonesia are PEEN Winners from the previous Competition

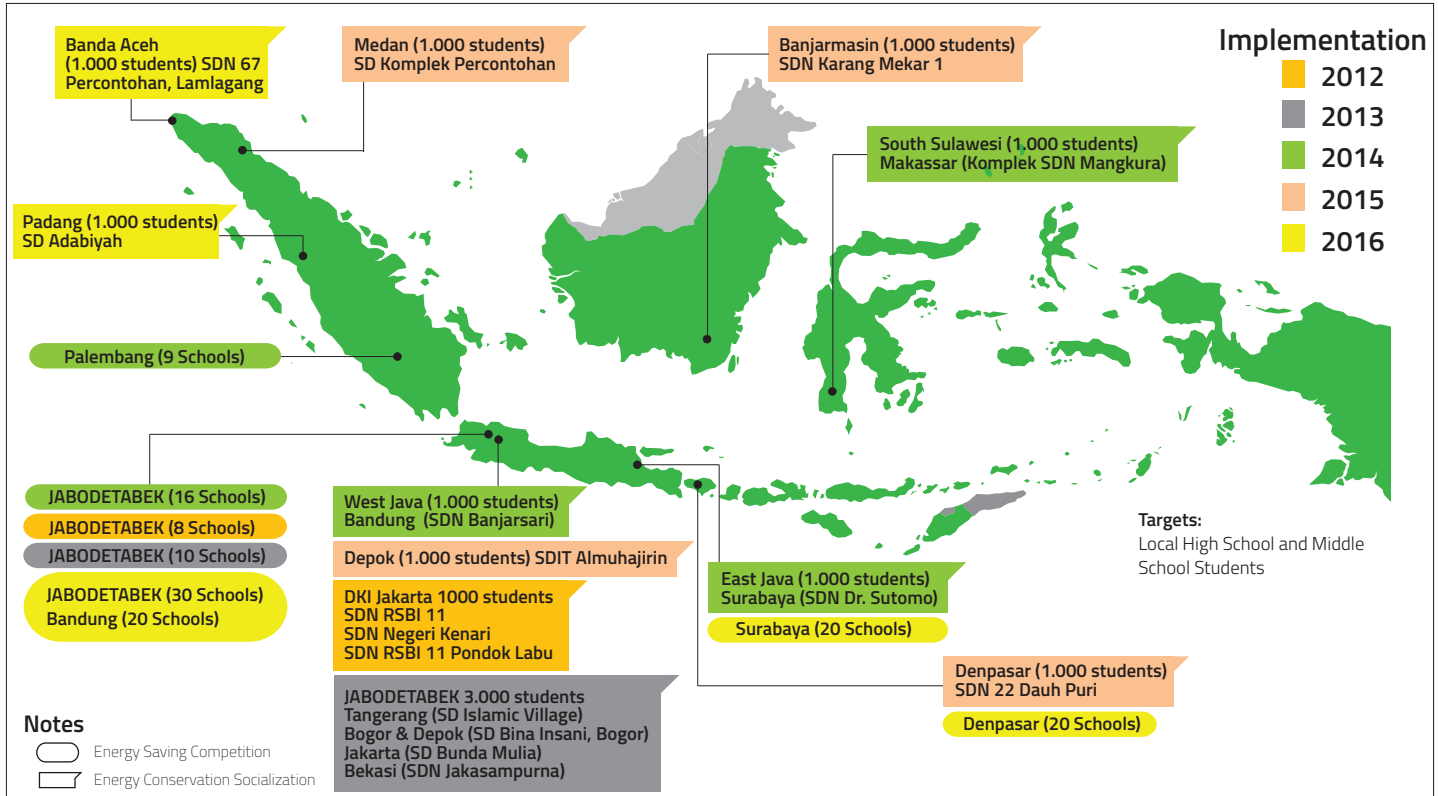
## A. Category : Best Practices Competition for Energy Efficient Buildings

- New and Existing Building
- Retrofitted Building
- Tropical Building
- Special Submission
- Green Building
  - Small and Medium (GFA 300-5,000 m<sup>2</sup>)
  - Large (GFA>5,000 m<sup>2</sup>)

## B. Category : Best Practices Competition for Energy Management in Buildings and Industries

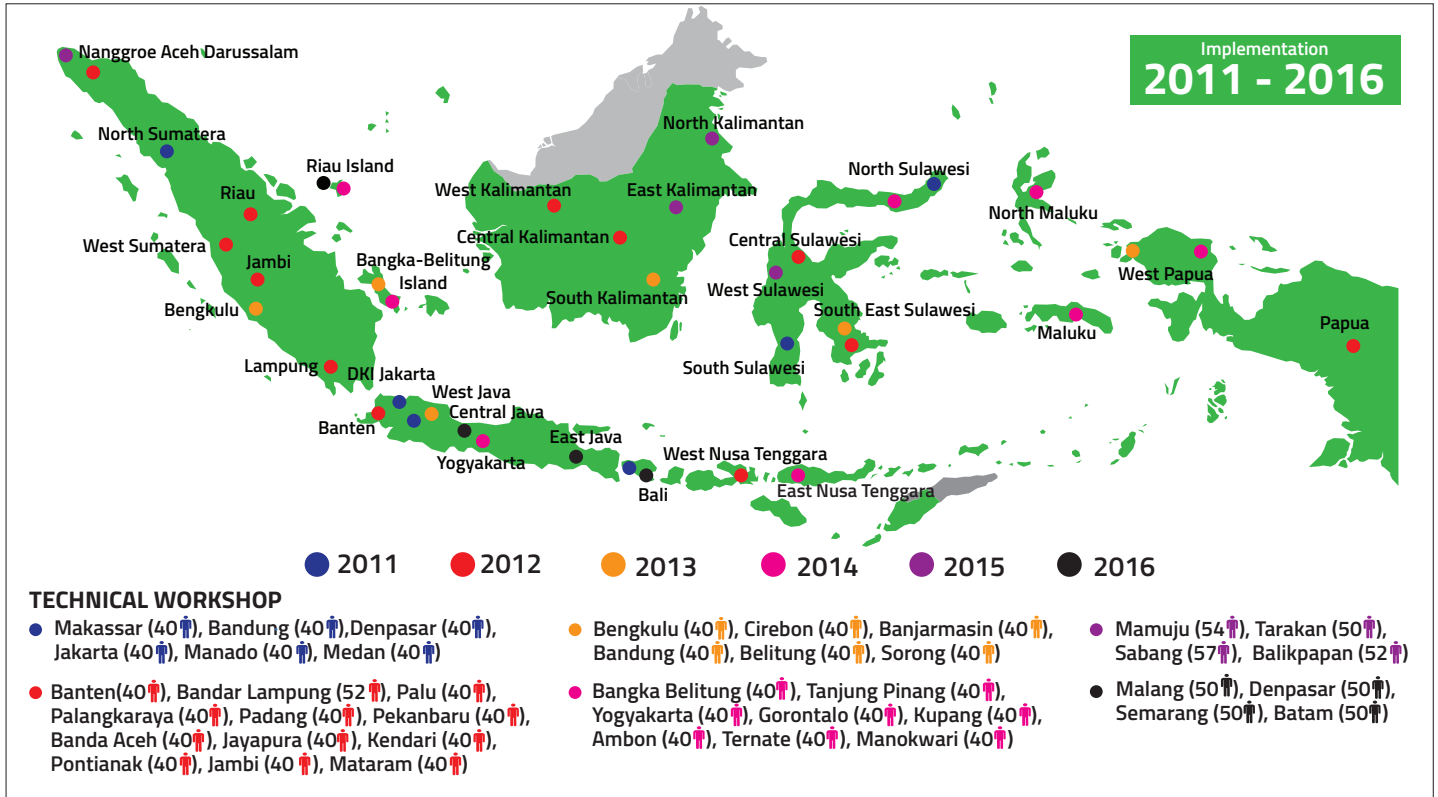
- Building
  - Small and Medium (=2,000 MWh/Year)
  - Large (>2,000 MWh/Year)
- Industry
  - Small and Medium (TEC= 30 Million MJ/Year)
  - Large (TEC> 30 Million MJ/Year)
- Special Submission (Industry)
- Special Submission (Building)

# ENERGY SAVING COMPETITION AND ENERGY CONSERVATION SOCIALIZATION IN EDUCATIONAL INSTITUTIONS

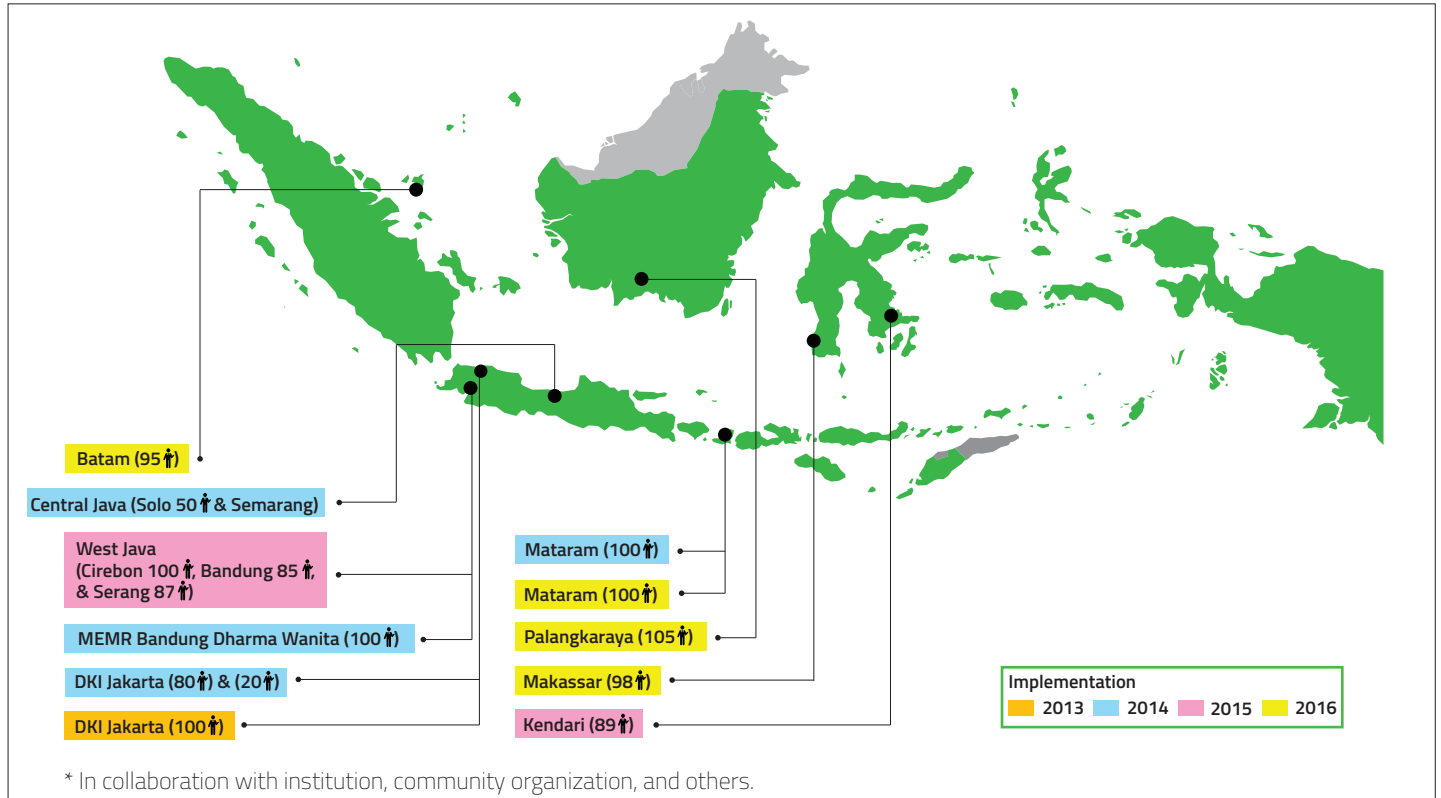




# ENERGY CONSERVATION WORKSHOP FOR LOCAL GOVERNMENTS



# ENERGY CONSERVATION SOCIALIZATION WORKSHOP FOR PUBLIC





## **Data & Information of Energy Conservation Program 2016**

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**Bangkit Arif Adi Sembodo**

**Fanit Akmal Bimantya Hakiman**



Directorate of Energy Conservation  
Directorate General of New and Renewable Energy and Energy Conservation  
Ministry of Energy and Mineral Resources

