Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

THE TRAINING WORKSHOP ON HARMONIZATION OF ENERGY EFFICIENCY TEST METHODS OF REFRIGERATORS

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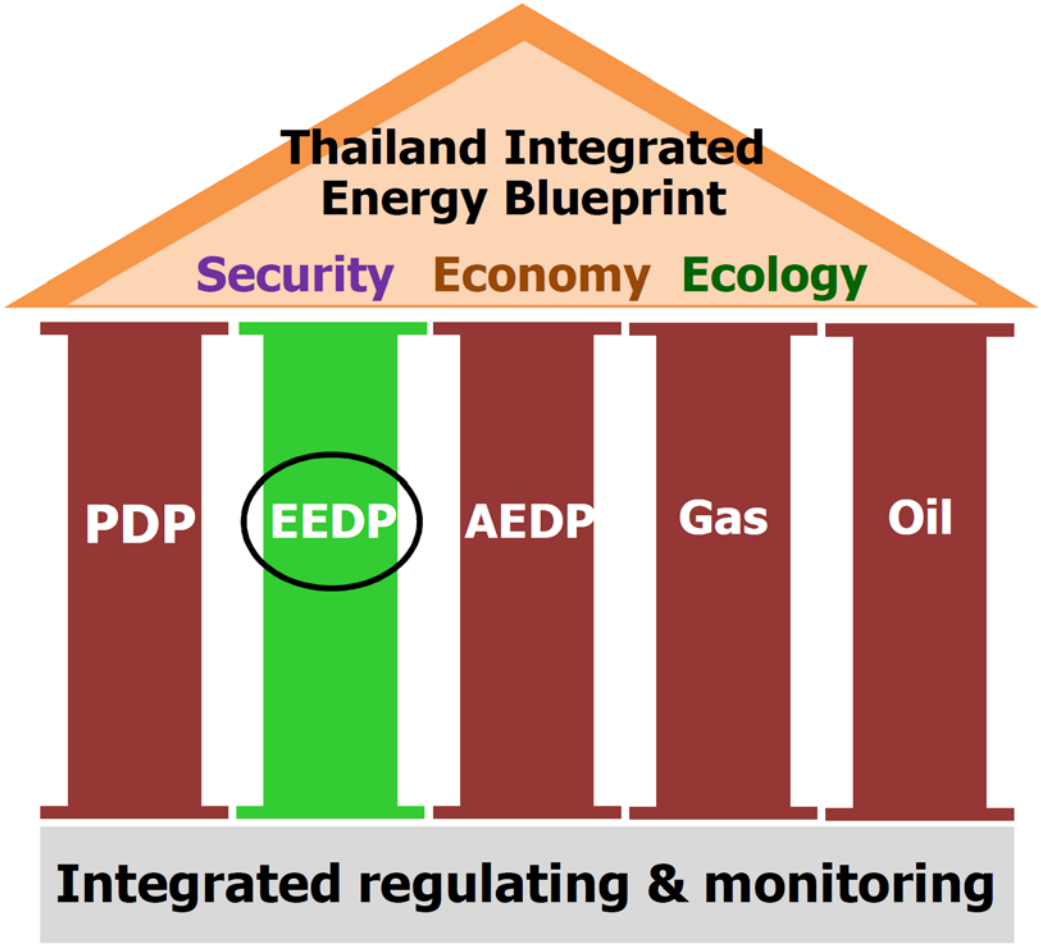
Content

Content

Thailand Integrated Energy Blueprint

Integrating 5 Major National Energy Plans



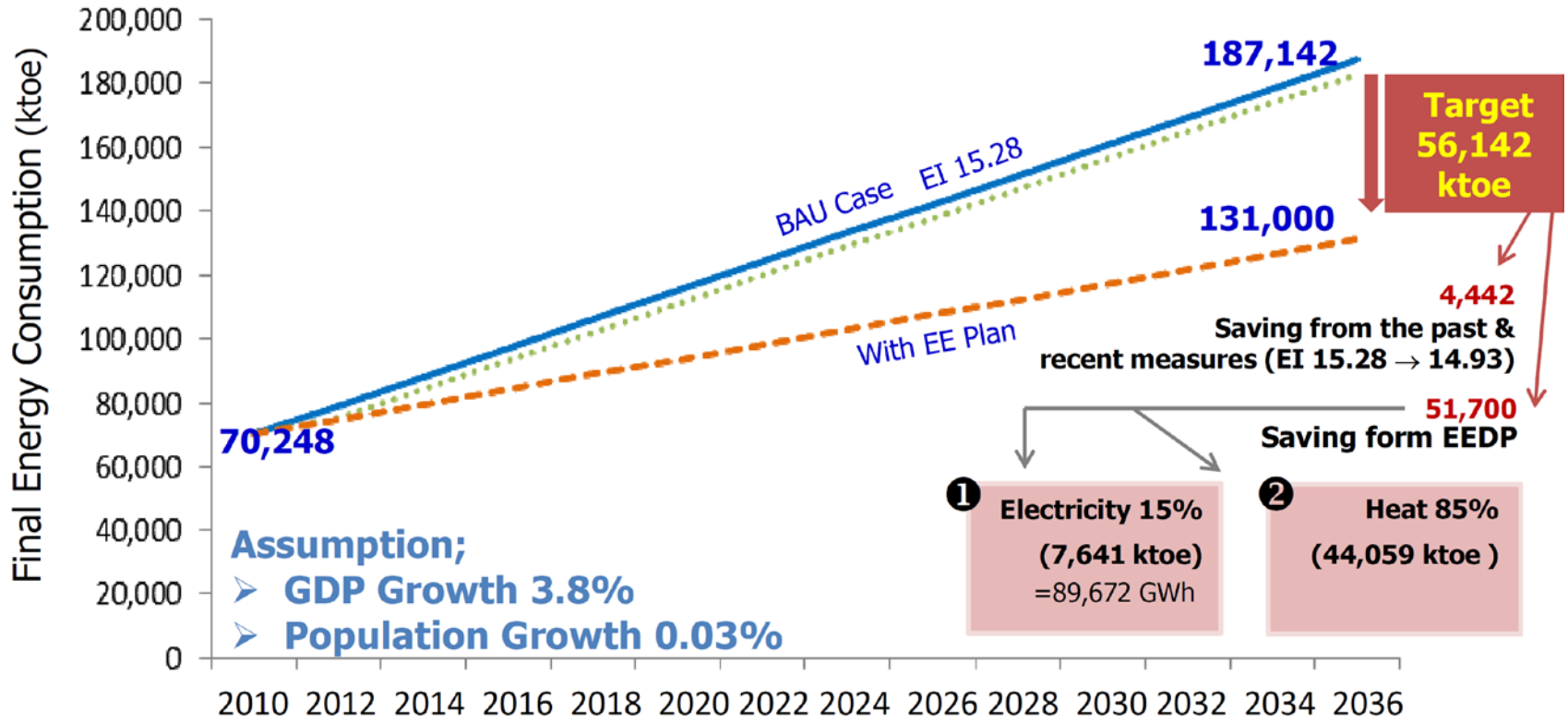
- Based on the same period through long term approach planning **(2015-2036)**
- Area – Based & Sectorial Based Approach
- Main Focus on Country's Competitiveness & Sustainability

Energy Efficiency Plan

New Energy Efficiency Development Plan (2015-2036)

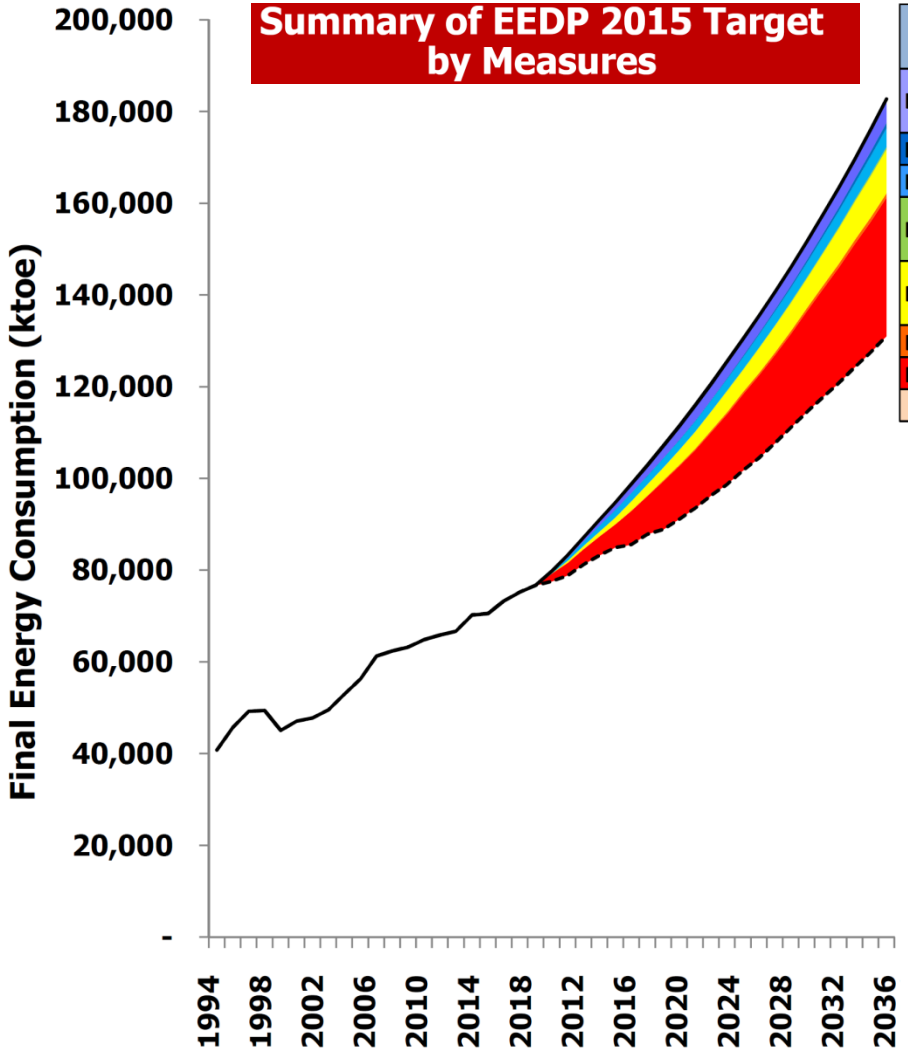
A Target to reduce Energy Intensity by 30% in 2036, compared with that in 2010

EI (2010) actual	EI (2013) actual	EI (2030) forecast	EI (2036) forecast
15.28 ktoe/billion baht	**14.93** ktoe/billion baht	**11.0** ktoe/billion baht	**10.7** ktoe/billion baht



Energy Efficiency Plan

New Energy Efficiency Development Plan (2015-2036)



Expected Enegy Saving by Economic sector		Total (ktoe)	Total (%)
EE1	Enforcement of energy conservation standard in designated factory/building	5,156	10%
EE2	Building Energy Code (BEC) for the new buildings	1,166	2%
EE3	Energy Labeling (HEPs & MEPs)	4,149	8%
EE4	Energy Efficiency Resource Standard (EERS) for large energy producers and distributors	9,524	18%
EE5	Financial Incentives and support for energy performance achievement	991	2%
EE6	Promoting greater use of LED	500	1%
EE7	Energy saving measures in transport sector	30,213	58%
Total (ktoe)		51,700	100%

Economic Sector

1. Industry
2. Commercial
3. Residential
4. Transportation

Content

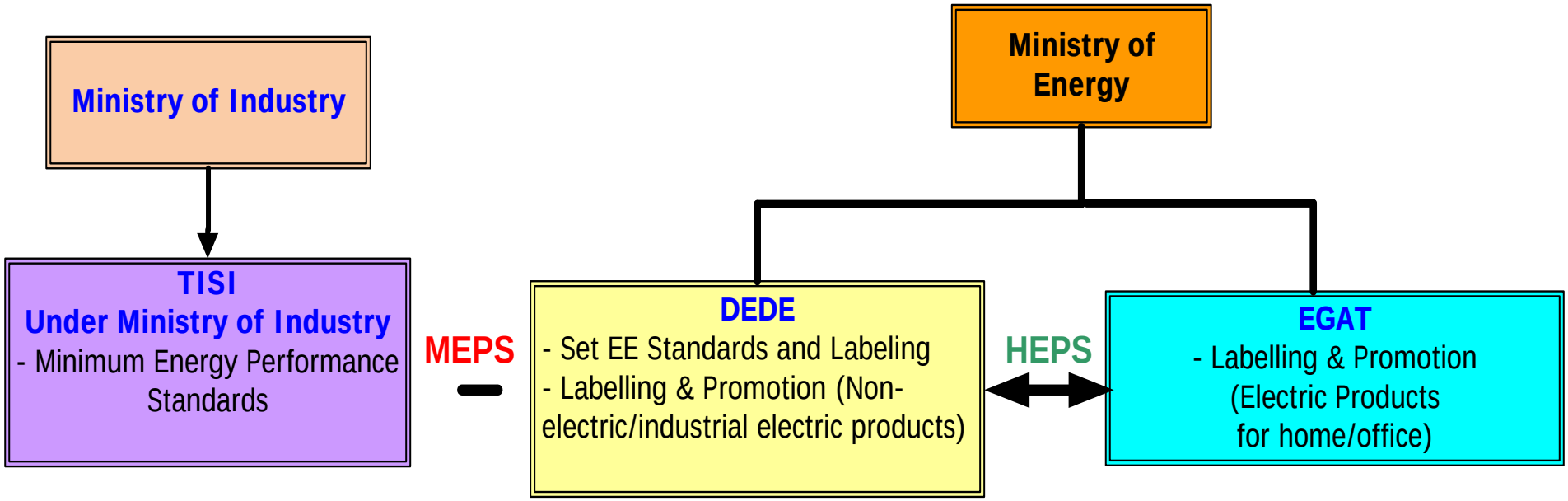
1.

2. Standard & Labeling Measure

3.

Standards and Labeling

Thailand Energy Efficiency S&L Structure for home appliances, equipments & material (MEPS & HEPS)



TISI: Thai Industrial Standards Institute

DEDE: Department of Alternative Energy Development and Efficiency

EGAT: Electricity Generating Authority of Thailand

Standards and Labeling

Framework of EES&L Measures

MEPS: Minimum Energy Performance Standards

- Both voluntary and mandatory program
- Collaboration between DEDE and TISI
- Standards are set up by DEDE, but they are regulated by TISI.

voluntary certification mark

mandatory certification mark

HEPS: High Energy Performance Standard

- Voluntary program
- Collaboration between DEDE and EGAT
- Standards are set up by DEDE, and labeling programs are responsible by DEDE and EGAT

Electric products (Home/Office)

Non-Electric and Industrial Electric products

Standards and Labeling

Labeling for electric products (Home / Office appliances)

Energy Consumption (kWh / year)

Efficiency (BTU / hr / Watt)

EGAT : Electricity Generating Authority of Thailand

Ministry of Energy

source : EGAT

No.5 Labeling Products

Year	Products	Label amount
1994	Refrigerators	33,214,322
1995	Air Conditioner	20,257,987
1996	Compact Fluorescent Lamp	86,602,180
1998	Electromagnetic Ballast	7,581,722
1999	Brown Rice	9,738,862
2001	Electric fans	67,099,579
2004	Rice Cooker	2,784,295
	Luminaire (T8)	52,840
2009	Oscillator Electric Fan	1,273,680
	Fluorescent T5 Lamp	11,814,555
	Electronic Ballast for T5	5,890,976
2010	Standby Power : TV	5,628,302
	Standby Power: monitor	1,545,450

Year	Products	Label amount
2010	Electric Pot	4,082,850
	Luminaries for T5	21,420
2011	Water Heater	3,395,210
	Iron	1,789,340
	Ventilator fan	1,082,200
2012	Washing Machine	733,800
	LED Lamp	3,145,870
2013	Microwave Oven	11,300
	Induction Cooker	20,000
2014	TV : on mode	319,700
	Electric Kettle	25,800
2015	Refrigerated Display Cabinets	n.a.
	Automatic Water Pumps	n.a.
Total		**268,112,240**

Since 1994 , more than 268 millions labels have been issued

(upto 31 Dec 2014)

source : EGAT

Standards and Labeling

Labeling for non-electric / industrial electric products

Number 5 is shown the highest efficiency mark

Authority

Energy Saving

High Efficiency

Name of Product

Percentage of Efficiency Value

DEDE : Department of Alternative Energy Development and Efficiency

Energy Saving Labeling Products

1. Household LPG Gas Stoves
2. Variable Speed Drives
3. Flat Plate Glasses
4. Fiberglass Insulators
5. Three-Phase Induction Motors
6. Small Diesel Engines (Water Cooled)
7. Small Gasoline Engines (Air Cooled)
8. High Pressure Gas Stoves

Since 2006 ,
more than 17 millions
labels have been issued

Standards and Labeling

The Process of Setting Draft MEPS & HEPS

1 Year

DEDE hires a consultant

Setting the technical committee

Research on market share / standards / testing methods / etc.

Technical committee meeting

Product sampling / Testing

Public hearing

Draft MEPS & HEPS

Standards and Labeling

Draft HEPS to be legislated

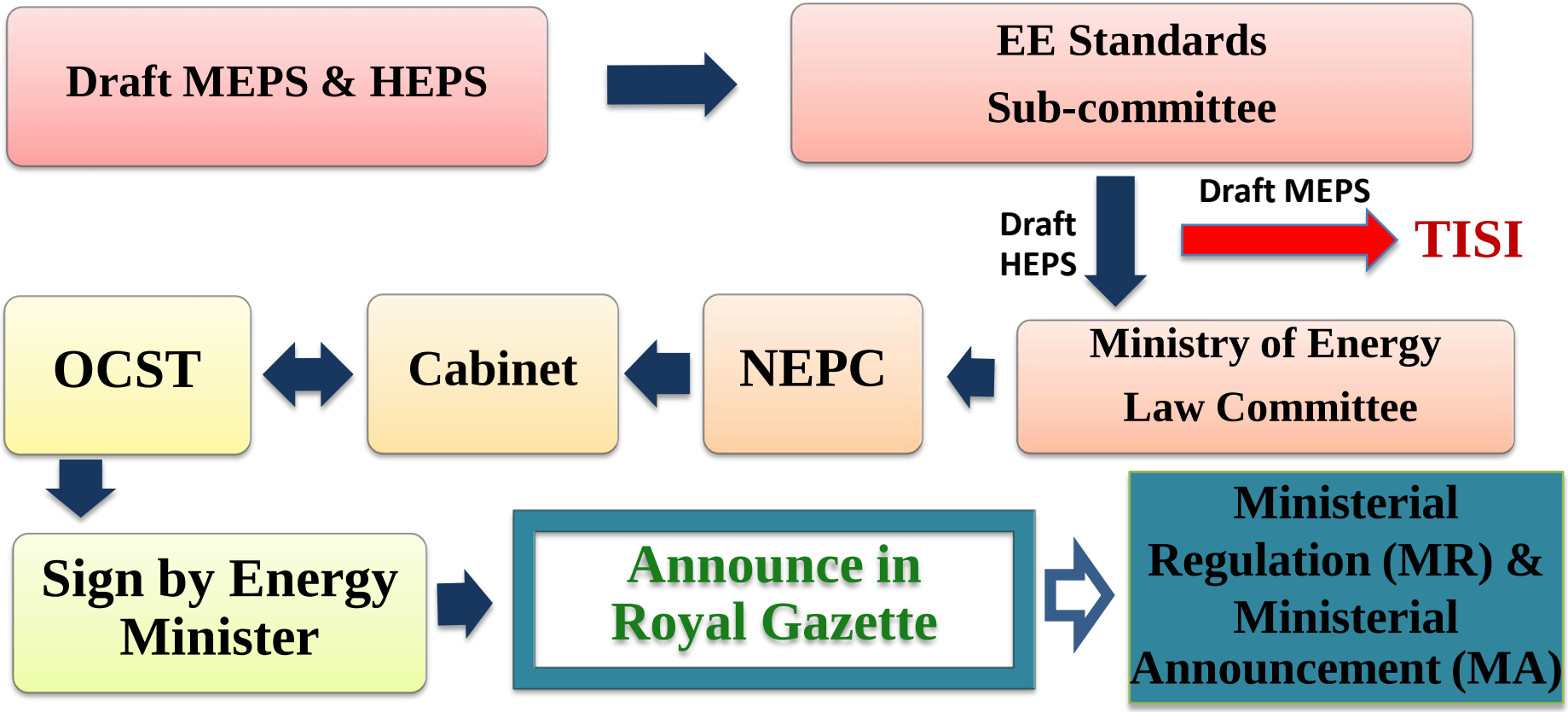
2-3 Years

TISI : Thai Industrial Standards Institute

NEPC: National Energy Policy Committee

OCST: Office of the Council of State of Thailand

Approved by:



Content

Activities Implemented of Refrigerators

Refrigerators

Activities Implemented of Refrigerators

Refrigerator Standard (MEPS) : Compulsory Measure

TIS 2186-2547 (2004) : Energy Efficiency

Energy consumption criteria for 1 door refrigerators	
Size	Energy consumption (kWh/y)
AV < 100	0.80 AV + 300
AV ≥ 100	0.46 AV + 171

Energy consumption criteria for 2 door refrigerators	
Size	Energy consumption (kWh/y)
AV < 450	0.46 AV + 457
AV ≥ 450	0.80 AV + 457

Activities Implemented of Refrigerators

Refrigerator Standard (HEPS) : Voluntary Measure

DEDE Ministerial Regulation (MR) & Announcement (MA) for HEPS

Energy consumption criteria for 1 door refrigerators

Size	MR	MA
	Energy consumption (kWh/y)	
AV < 100	(0.68 AV + 255) to (0.60 AV + 224)	(0.68 AV + 255)
AV ≥ 100	(0.39 AV + 145) to (0.34 AV + 128)	(0.39 AV + 145)

Energy consumption criteria for 2 door refrigerators

Size	MR	MA
	Energy consumption (kWh/y)	
AV < 450	(0.39 AV + 388) to (0.34 AV + 342)	(0.39 AV + 388)
AV ≥ 450	(0.68 AV + 388) to (0.60 AV + 342)	(0.68 AV + 388)

Activities Implemented of Refrigerators

DEDE had studied and revised Energy consumption criteria for refrigerators in 2013

Statistical Analysis of Refrigerators

Category	Sampling	MA	Max.	Min.	Ave.	SD.
1 door refrigerators AV < 100 L	8 Units	(0.68AV + 255)	261.7	178.8	235.90	33.10
1 door refrigerators AV ≥ 100 L	27 Units	(0.39AV + 145)	200.02	146.37	181.24	15.40
2 door refrigerators AV < 450 L	63 Units	(0.39AV + 388)	498.23	146.37	405.66	53.02
2 door refrigerators AV ≥ 450 L	28 Units	(0.68AV + 388)	774.5	329.2	541.10	111.6

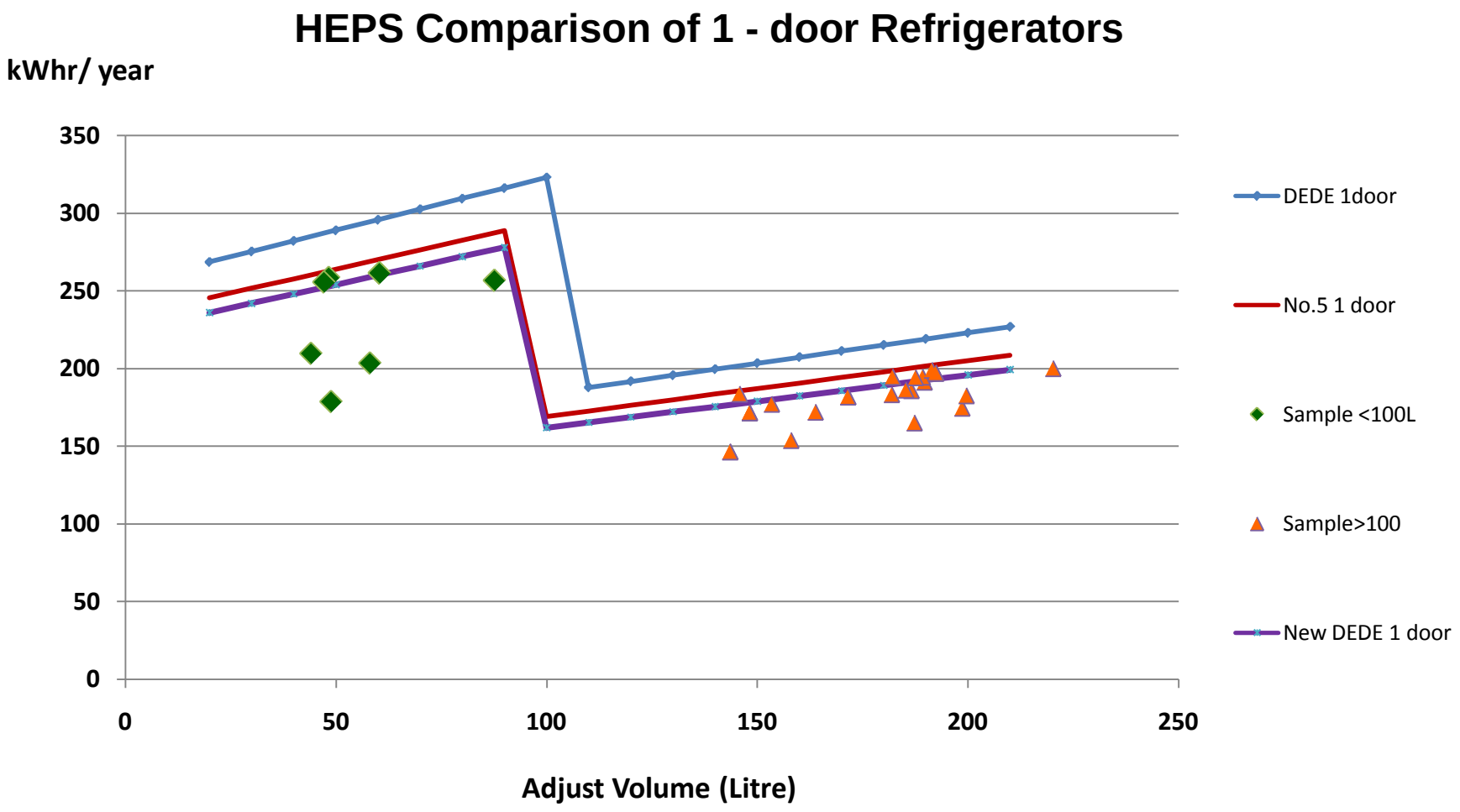
Activities Implemented of Refrigerators

Qualified EE Testing Laboratories for Refrigerators : ISO/IEC 17025

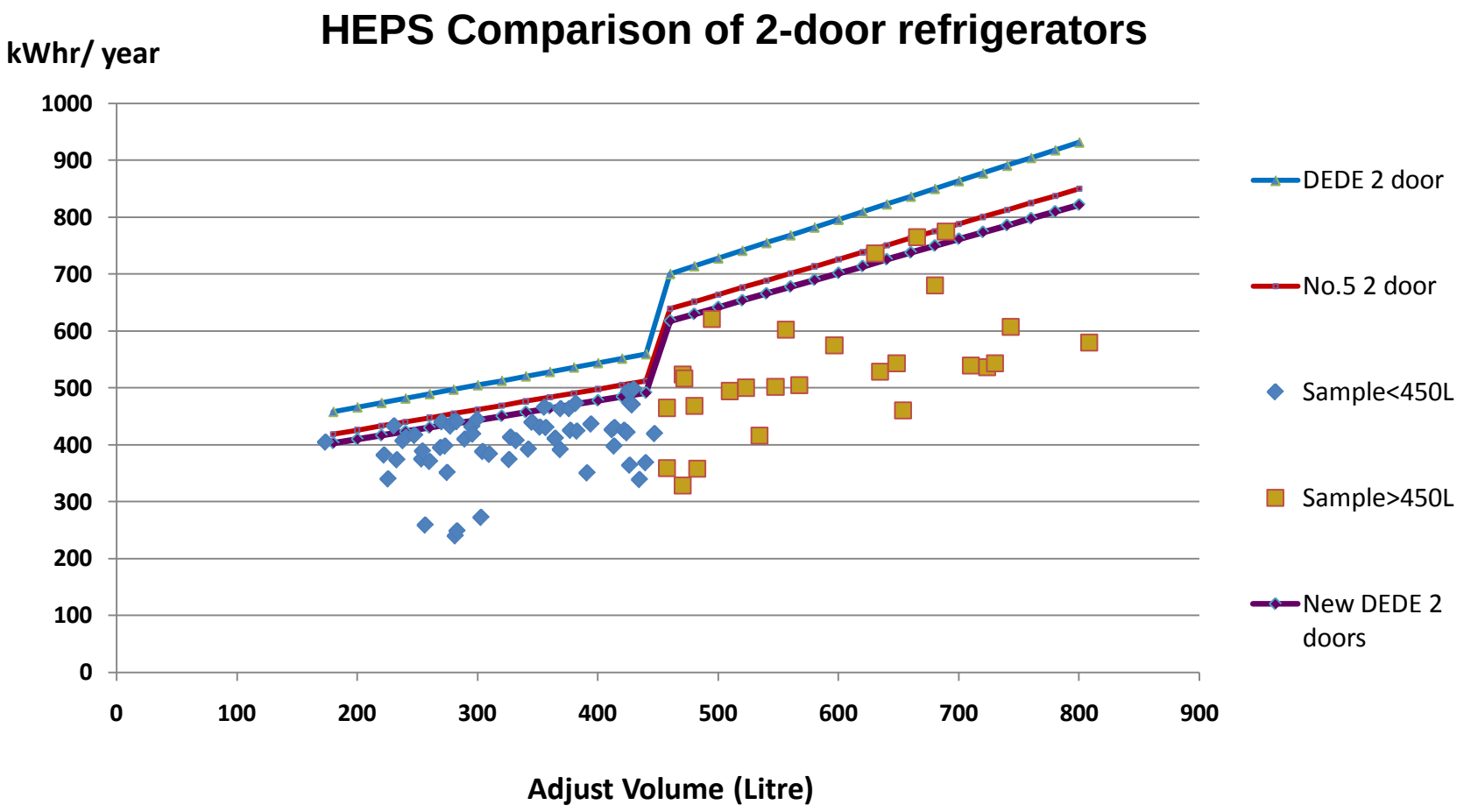
TIS 2186-2547 (2004) : Energy Efficiency

1. Electrical and Electronics Institute
2. TUV SUD PSB Thailand
3. Intertek

Activities Implemented of Refrigerators



Activities Implemented of Refrigerators



Activities Implemented of Refrigerators

Energy Consumption Criteria for 1 Door Refrigerators

AV < 100 L

Criteria	Energy Consumption (kWh)	Percentage of Energy Reduction	Pass (%)
Current MA	**0.68AV+255**	**-**	**100**
	0.66AV+247	3.0%	100
	0.65AV+242	5.0%	100
	0.64AV+238	6.5%	100
	0.63AV+237	7.0%	100
Label No.5 EGAT	**0.62AV+233**	**8.5%**	**100**
	0.61AV+230	**10.0%**	**100**
Upper Bound of MR	**0.60AV+224**	**11.7%**	**50.0**
	0.55AV+205	19.7%	37.5
	0.54AV+204	20.0%	37.5
	0.51AV+191	25.0%	37.5
	0.48AV+179	30.0%	25.0

MR

New Propose MEPs

New Propose MA

Activities Implemented of Refrigerators

Energy Consumption Criteria for 1 Door Refrigerators
AV ≥ 100 L

	Criteria	Energy Consumption (kWh)	Percentage of Energy Reduction	Pass (%)
MR	**Current MA**	**0.39AV+145**	-	**100**
		0.38AV+141	3.0%	**100**
		0.37AV+138	5.0%	100
	Label No.5 EGAT	**0.36AV+133**	**7.5%**	**100**
		0.35AV+131	**10.0%**	**100**
	Upper Bound of MR	**0.34AV+128**	**12.0%**	**92.6**
		0.33AV+123	**15.2%**	**66.7**
		0.32AV+120	17.0%	**37.0**
		0.31AV+116	**20.0%**	25.9
		0.30AV+112	23.0%	**18.5**

New Propose MEPs

New Propose MA

Activities Implemented of Refrigerators

MEPS: The New Propose of Energy Consumption Criteria for 1 Door Refrigerators

AV < 100 L	AV ≥ 100 L
0.61AV+230	0.35AV+131

HEPS: The New Propose of Energy Consumption Criteria for 1 Door Refrigerators

AV < 100 L	AV ≥ 100 L
0.60AV+224	0.34AV+128

Activities Implemented of Refrigerators

Energy Consumption Criteria for 2 Door Refrigerators

AV < 450 L

	Criteria	Energy Consumption (kWh)	Percentage of Energy Reduction	Pass (%)	
MR	Current MA	0.39AV+388	-	100	
		0.38AV+376	3.0%	100	
		0.37AV+369	5.0%	100	
	Label No.5 EGAT	0.36AV+354	7.5%	100	
		0.35AV+349	10.0%	98.4	New Propose MEPs
	Upper Bound of MR	0.34AV+342	12.0%	84.1	New Propose MA
		0.31AV+305	21.5%	46.0	
		0.30AV+299	23.0%	33.3	
		0.29AV+291	25.0%	22.2	
		0.28AV+279	28.0%	15.9	

Activities Implemented of Refrigerators

Energy Consumption Criteria for 2 Door Refrigerators

AV ≥ 450 L

MR

Criteria	Energy Consumption (kWh)	Percentage of Energy Reduction	Pass (%)	
Current MA	0.68AV+388	-	100	
	0.66AV+376	3.0%	100	
	0.65AV+369	5.0%	100	
	0.64AV+363	6.5%	100	
	0.63AV+361	7.0%	100	
Label No.5 EGAT	0.62AV+354	7.5%	100	New Propose MEPs
	0.61AV+349	10.0%	89.3	
Upper Bound of MR	0.60AV+342	11.7%	89.3	New Propose MA
	0.46AV+262	32.5%	64.3	
	0.41AV+233	40.0%	21.4	

Activities Implemented of Refrigerators

MEPS: The New Propose of Energy Consumption Criteria for 2 Door Refrigerators

AV < 450 L	AV ≥ 450 L
0.35AV+349	0.62AV+355

HEPS: The New Propose of Energy Consumption Criteria for 2 Door Refrigerators

AV < 450 L	AV ≥ 450 L
0.34AV+342	0.60AV+342

Activities Implemented of Refrigerators

Adoption of ISO 16358 and IEC 62552

- In 2016, DEDE will study and revise the new draft MEPS and HEPS of refrigerators again according to the new international standards i.e. ISO 16358 and IEC 62552

- TISI will adopt those new standards around the middle of 2016.

Activities Implemented of Refrigerators

Possible cooperation related to EE S&L

- Enhancing the Capacity of National Experts for Development and Implementation of EE standard & Labeling
  - Case studies in EES&L
  - Technical Training

- Regional Testing Lab. Cooperation
  - Round Robin Testing

- Regional S&L Strategy and Harmonization of Appliance and Equipment EES&L
  - Refrigerator , Air-Conditioner, LED lighting, etc.

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