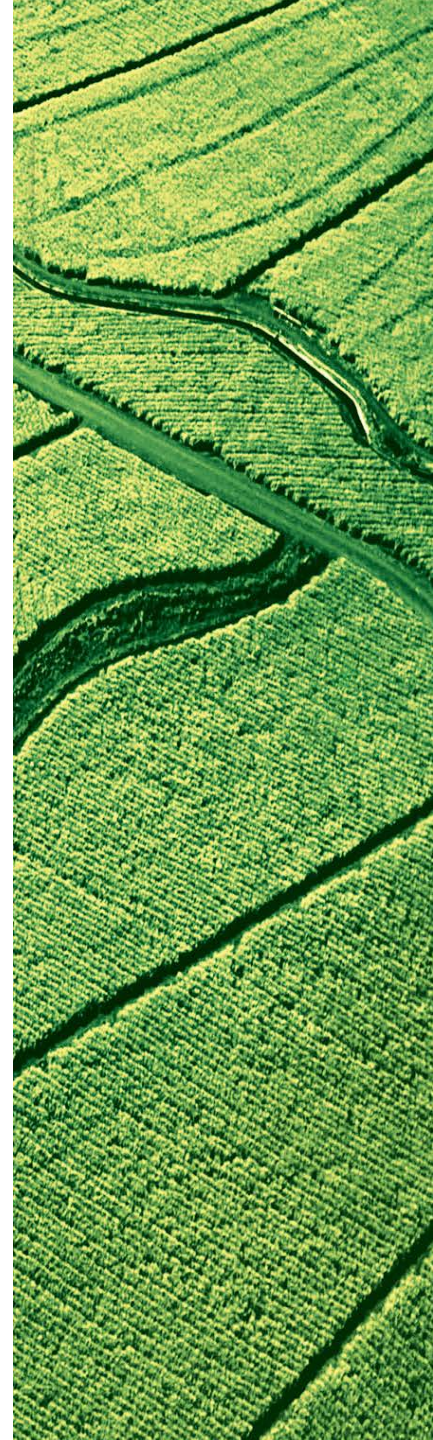**The 55th Meeting of the APEC Expert Group on Energy Efficiency & Conservation (EGEEC 55)**
17-20 Nov. 2020

Economy Update in Chinese Taipei

Energy Efficiency Management

The Policy Tools of Energy Efficiency Management

Mandatory Programs

- Minimum Energy Performance Standard (MEPS)
- Energy Efficiency Ranking Labeling
- Energy Management and Audit

Voluntary Programs

- Energy Conservation Labeling (ECL)
- Public Awareness, Education & Promotion
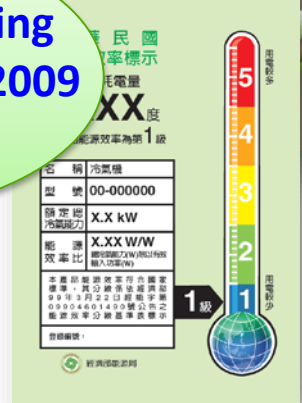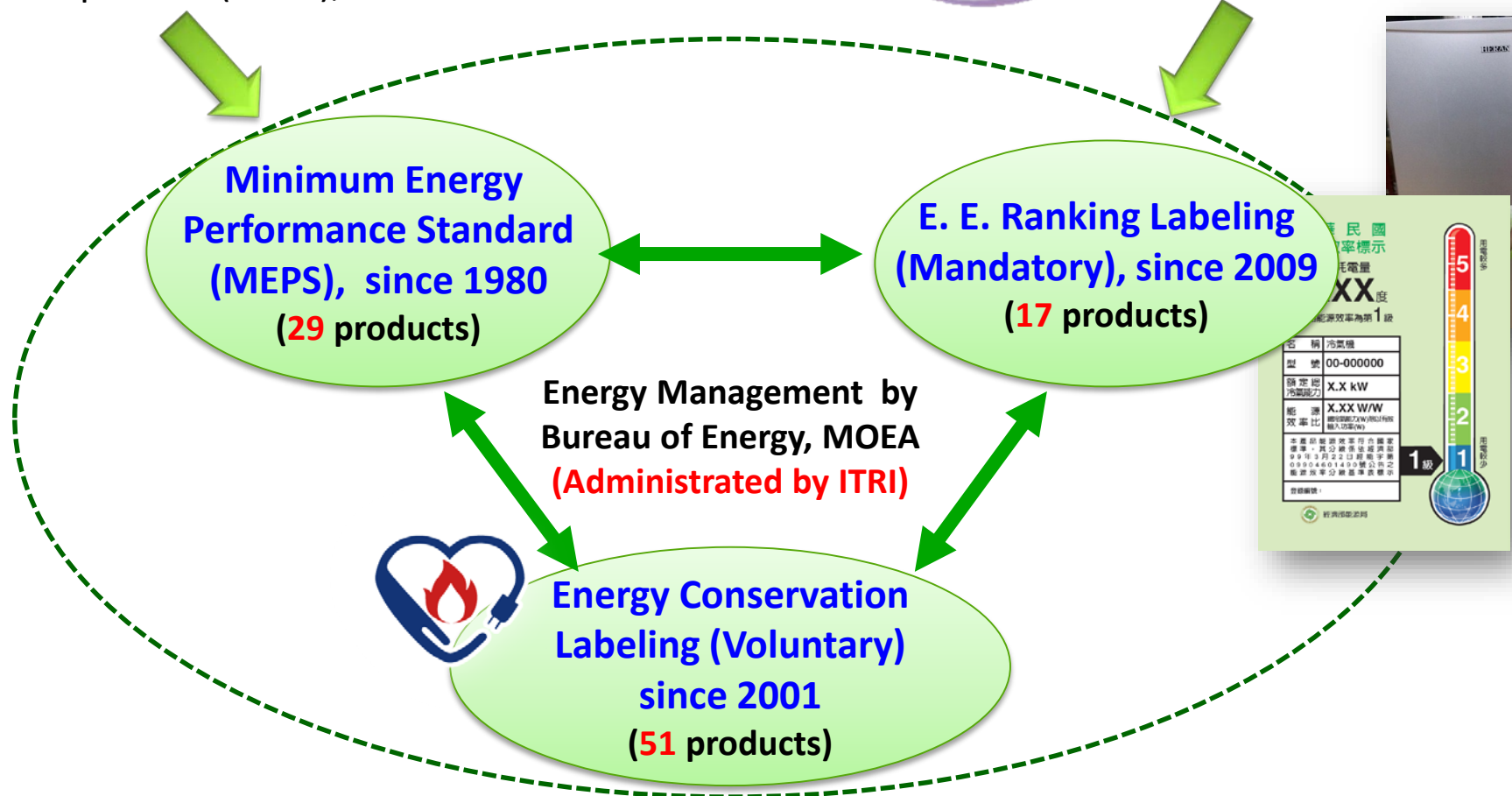- ESCO

Equipment EE Management

CNS
Bureau of Standards, Metrology & Inspection (BSMI), MOEA

Accreditation Foundation
Testing Lab Accreditation

Minimum Energy Performance Standard (MEPS), since 1980
(**29** products)

E. E. Ranking Labeling (Mandatory), since 2009
(**17** products)

Energy Management by Bureau of Energy, MOEA
(Administrated by ITRI)

Energy Conservation Labeling (Voluntary) since 2001
(**51** products)

Details of EE Management Programs

EE programs	MEPS	EE Ranking Labeling	Energy Conservation labeling
Category	Mandatory (since 1980)	Mandatory (since 2009)	Voluntary (since 2001)
Main Purpose and Function	Ban on import or sale of low energy efficiency products	Enforce manufactures to provide information of product energy efficiency	Encourage and promote high EE products
Execution in Progress	Set by BOE[1] and enforced by BSMI[2], follow the law of "The Commodity Inspection Act".	Promulgated by BOE. Manufacturers are required to register regulated products with BOE.	The standards are higher than national standards and MEPS by 10-50%
Revision Guidelines	Phase out the lowest energy efficiency products (15-30% of the total products)	Revise the ranking levels according to the new MEPS.	Revise the top 20-30% of the product standards

The labels will be adjusted every 3-5 years, based on the new MEPS and product market share

[1] Bureau of Energy
[2] Bureau of Standards, Metrology, and Inspection

Mandatory EE Management Programs

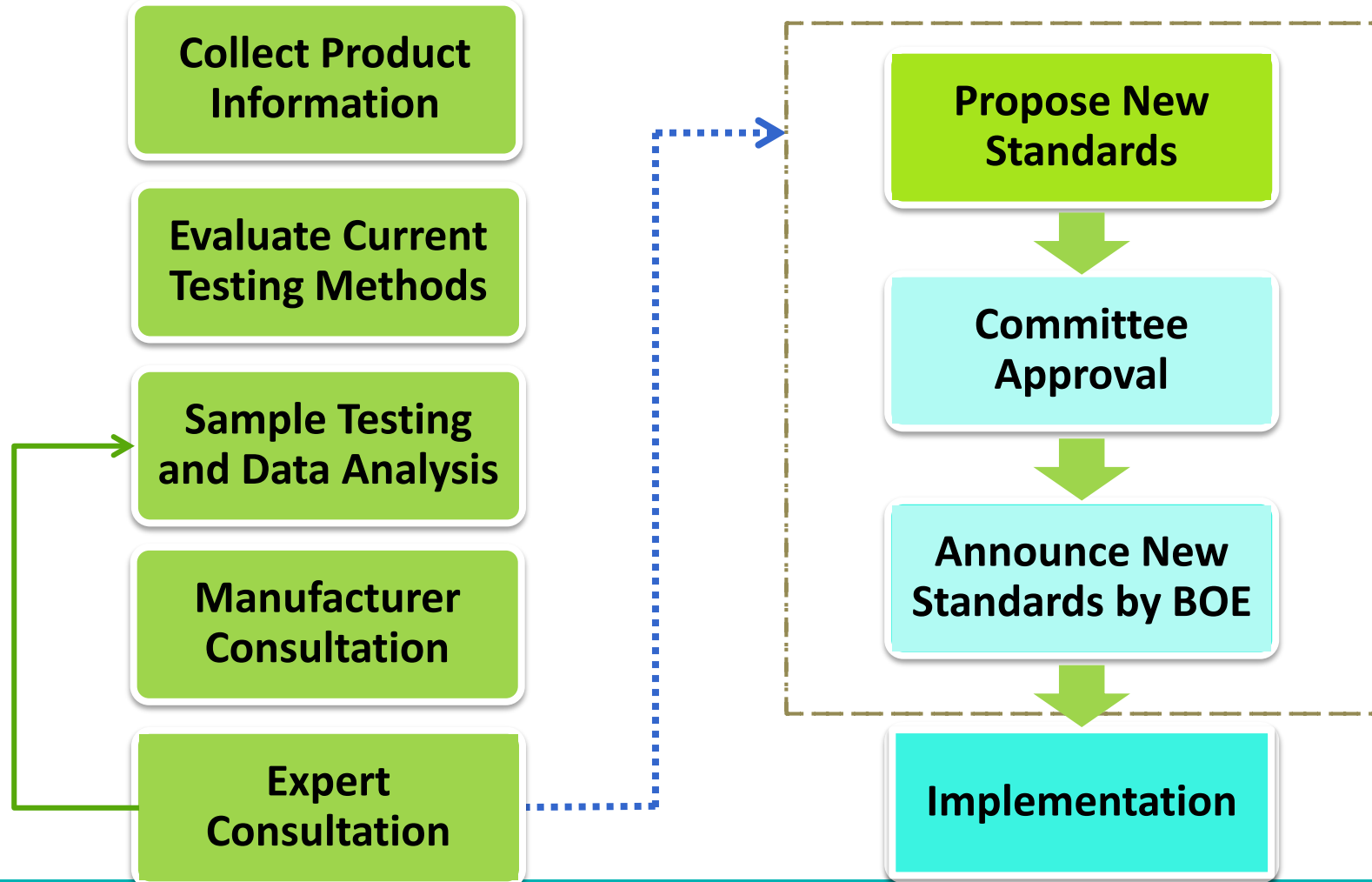| Policy	MEPS		EE Ranking Labeling
Date	Implemented on December, 1980		Implementation on July, 2009
Purpose	Remove the low efficiency products from market		Provide product information to consumers for purchasing effecient products
Item	**29** product categories		**17** product categories
Product	1. Air Conditioners (change EER to CSPF in 2016) 2. Refrigerators(2018) 3. Dehumidifiers(2018) 4. Fluorescence Lamps 5. Ballast for Fluorescent Lamps 6. Compact florescent lamps 7. Fluorescent Lamps with embedded ballasts 8. Incandescent bulbs 9. Electric Hot Water Pots 10. Electric Storage Tank Water Heaters 11. Instantaneous Gas Water Heaters 12. Gas Stoves 13. Vehicles 14. Motorcycles 15. Fishing vessel engines 16. Low-voltage single-phase induction motors	17. Low-voltage three-phase squirrel-cage induction motors 18. LED Lamps 19. Water chilling air-condition systems 20. Boilers 21. Warm-Hot Drinking Water Dispensers 22. Chilled-Warm-Hot Drinking Water Dispensers 23. Warm-Hot Drinking Water Fountain 24. Chilled-Warm-Hot Drinking Water Fountain 25. Water dispenser supplied by packaged drinking water 26. Rice Cooker 27. Air Compressor(2021.01.01) 28. Electric storage drink water heaters(2021.01.01) 29. Double-capped LED lamps (2022.01.01)	**1. Air Conditioners (2016.01.01RV)** **2. Refrigerator/Freezer (2018.01.01RV)** 3. Automobiles (2010.7.1) 4. Motorcycles (2010.7.1) **5. Dehumidifiers (2018.01.01RV)** 6. Self-ballasted fluorescent lamps (2011.7.1) 7. Instantaneous Gas Water Heaters (2012.12.6) 8. Gas Stoves(2012.12.06) 9. Electric hot water pots (2015.01.01) 10. Electric Storage Tank Water Heaters (2015.10.01) 11. Warm-Hot Drinking Water Dispensers (2016.12.01) 12. Chilled-Warm-Hot Drinking Water Dispensers (2016.12.01) **13. Warm-Hot Drinking Water Fountain (2018.01.01)** **14. Chilled-Warm-Hot Drinking Water Fountain (2018.01.01)** 15. Rice Cooker(2020.01.01) 16. Water chilling packages using the vapor compression cycle (2020.07.01) 17. Air Compressor (2021.01.01)

Voluntary EE Management Program

Policy	Energy Conservation Labeling (ECL)		
Date	Implemented on December, 2001		
Purpose	Encourage consumers to buy high-efficiency products and to enhance market penetration of efficient products		
Item	**51 product categories**		
Product	1. Air Conditioners 2. Refrigerators 3. Dehumidifiers 4. Circulation Fans 5. Washing Machines 6. Clothes Dryers 7. Fluorescence Lamps 8. Hand Dryers 9. Hair Dryers 10. Warm-Hot Drinking Water Dispensers 11. Chilled-Warm-Hot Drinking Water Dispensers 12. Chilled-Warm-Hot Water Fountain Machines 13. Warm-Hot Water Fountain Machines 14. Vehicles 15. Motorcycles 16. Fluorescent Lamps with embedded ballasts	17. Gas burning cooking appliances 18. Instantaneous Gas Burning Water Heaters 19. Electric Cookers 20. Electric Storage Tank Water Heaters 21. Electric Hot Water Pots 22. Exit Lights and Emergency Direction Lights 23. Televisions 24. Displays 25. DVD Recorder and Player 26. Indoor Light Fixtures 27. Integrated Stereos 28. Compact Fluorescent Lamps 29. Copy machines 30. Printers 31. Air Cleaners 32. Luminaires for road and street lighting	33. Ventilating Fans for Bath Room Use 34. Ventilating Fans for Window Type 35. Notebook Computers 36. Desktop Computers 37. Air Source Heat Pump Water Heater 38. Range Hoods 39. Microwave Ovens 40. Axial flow Fans 41. Centrifugal fan 42. Ballast for Fluorescent Lamps 43. Electric Ovens 44. Electric Storage Tank Boiling Water Heaters 45. LED planar Lighting Fixtures 46. LED Lamps 47. VFI UPS 48. High bay Luminaire 49. Down light Luminaire 50. Office and Business Area Luminaire 51. Indoor parking lot smart lighting fixtures

Revising Process of ECL

ECL will be revised every 3-5 years based on market share

Collect Product Information

Evaluate Current Testing Methods

Sample Testing and Data Analysis

Manufacturer Consultation

Expert Consultation

Propose New Standards

Committee Approval

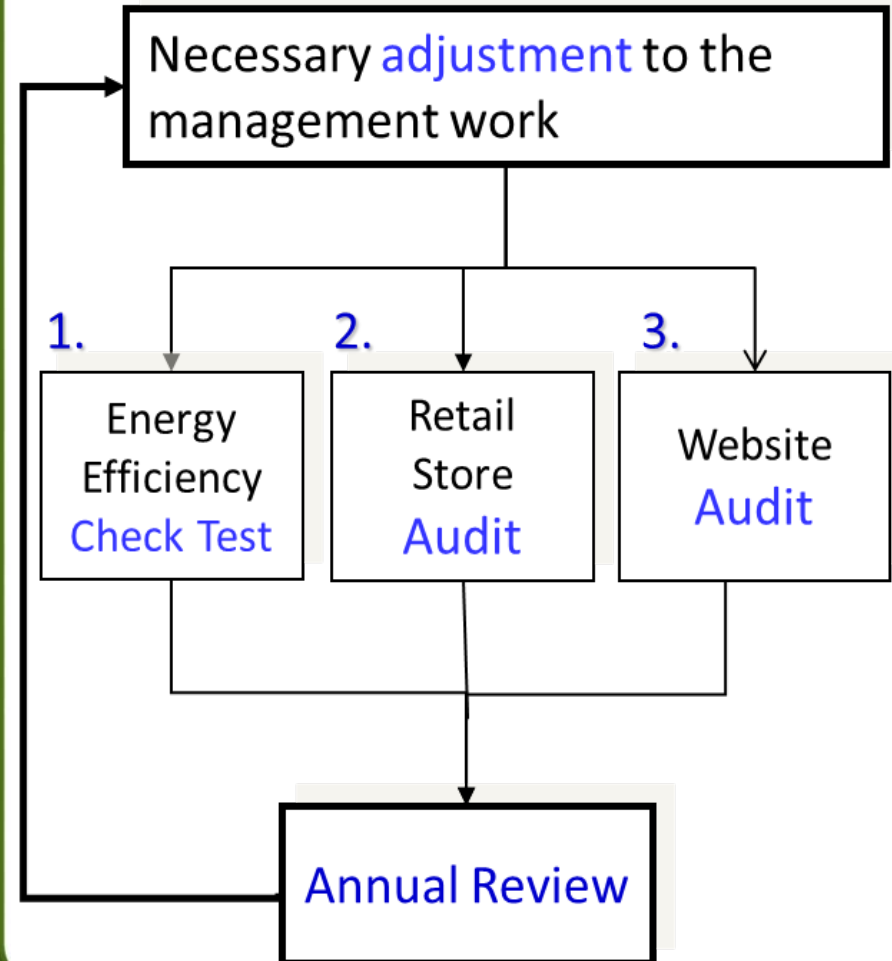Announce New Standards by BOE

Implementation

Market Surveillance in ECL program

Measures

1. Check test at least 900 products every year. The manufacturers in each product item will be randomly selected for the check test.
2. Audit at least 4,200 retail stores for the correct usage of the labels.
3. Audit manufacturers and e-commerce websites for the correct usage of the labels.
4. Review the outcomes of the process and make necessary adjustment to the measures

Process Flow

Necessary adjustment to the management work

1. Energy Efficiency Check Test
2. Retail Store Audit
3. Website Audit

Annual Review

Achievements of EE Ranking Labeling Program
(Air Conditioner and Refrigerator as examples)

- The rebate programs boosted the market share of high efficiency products in 2011 ,2012 and 2015.
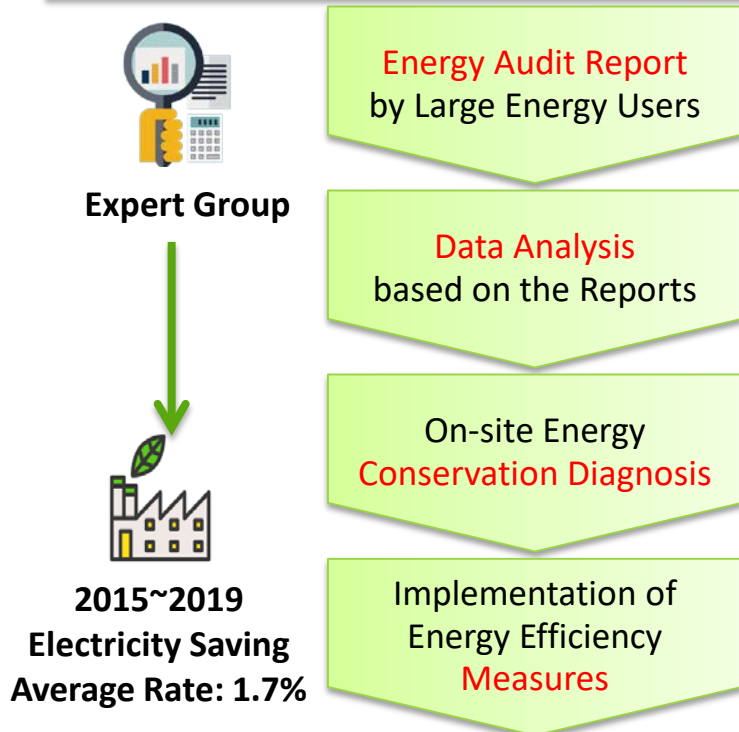- Air conditioners: EER changed to CSPF in 2016, and Grade 1 benchmark is 52% higher than MEPS. The market share for Grade 1 is about 76% in 2018, and 81% in 2019.
- Refrigerator: Promoted benchmark for Grade labeling in 2018. Grade 1 benchmark is 60% higher than MEPS. The market share for Grade 1 is about 67% in 2018, and 74% in 2019.

market share of ACs

Grade	Share
Grade 5	12.39%
Grade 4	2.27%
Grade 3	0.27%
Grade 2	3.75%
Grade 1	81.32%

Market sales of 1.57 million in 2019 (Chinese Taipei)

market share of refrigerators

Grade	Share
Grade 5	0.19%
Grade 4	3.13%
Grade 3	2.83%
Grade 2	19.37%
Grade 1	74.48%

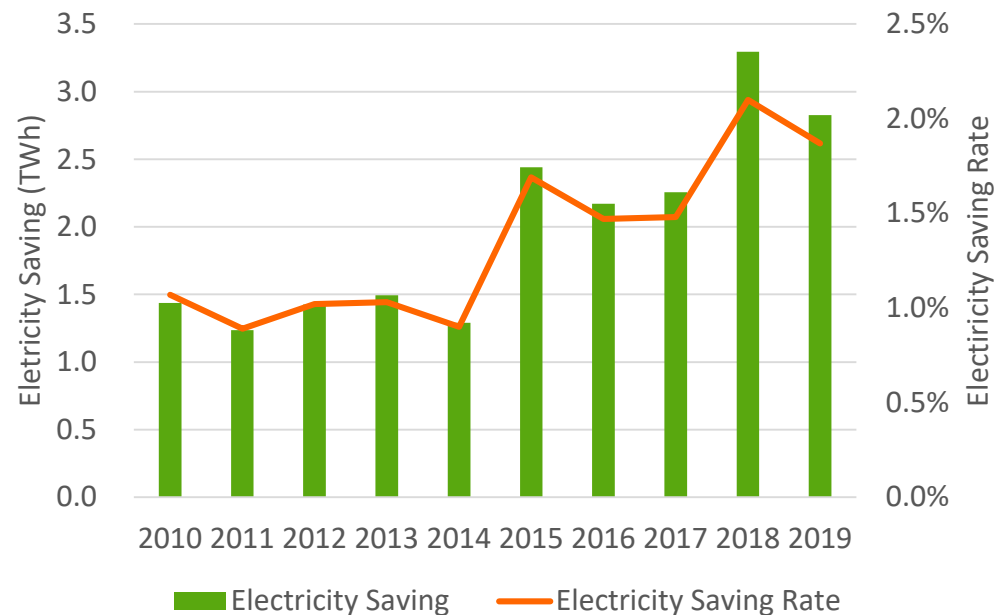Market sales of 657,000 units in 2019 (Chinese Taipei)
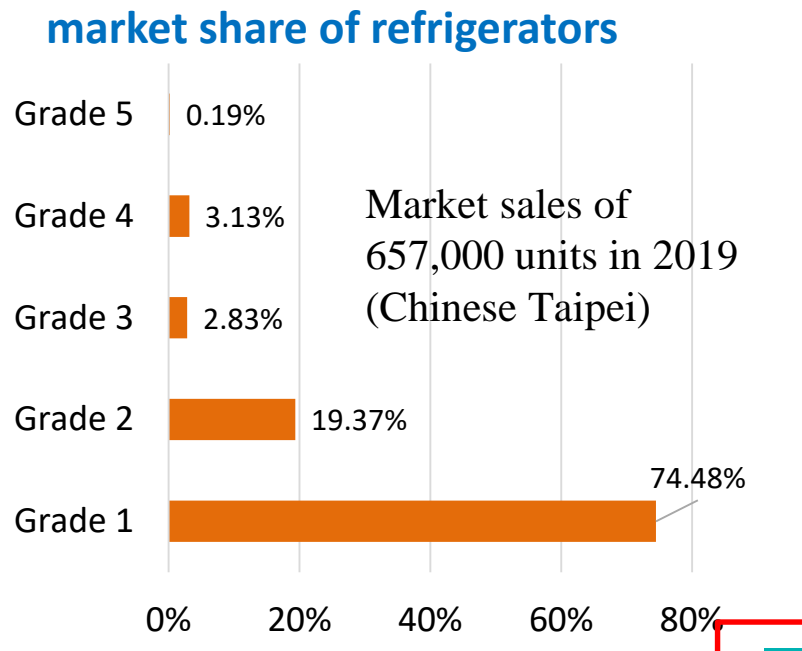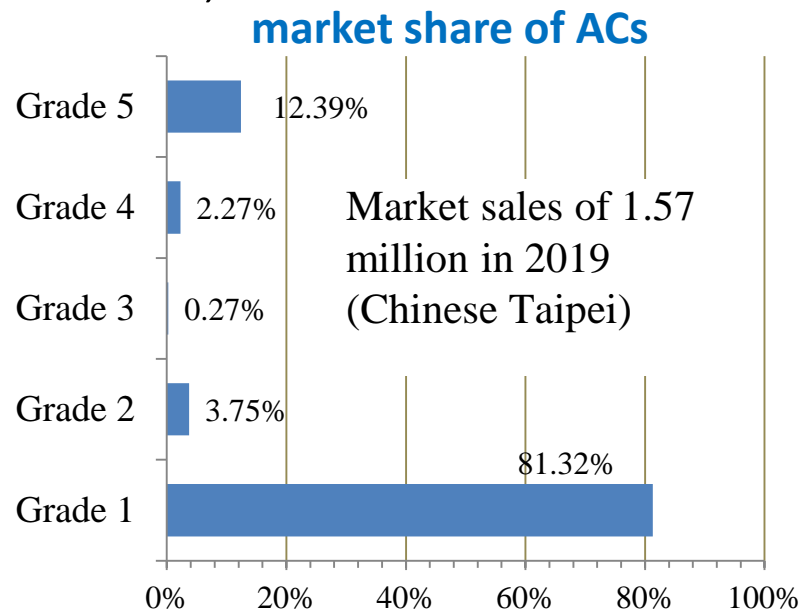
Energy Management and Audit

- Industrial and commercial sectors consumed about <u>81%</u> of the total electricity consumption.
- Approximately 4,800 large energy users are regulated under the Energy Management Act.

Process of Energy Audit Scheme

Expert Group

Energy Audit Report by Large Energy Users

↓

Data Analysis based on the Reports

↓

On-site Energy **Conservation Diagnosis**

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Implementation of Energy Efficiency **Measures**

2015~2019 Electricity Saving Average Rate: 1.7%

Electricity Saving for Large Energy Users

Eletricity Saving (TWh) / Electricity Saving Rate

Years: 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

Legend: ▬ Electricity Saving — Electricity Saving Rate

Public Awareness, Education & Promotion

Holding Energy Saving Campaign during summertime

- Raise public awareness on energy saving by energy saving online campaign.
- Hold workshop events of "Energy Saving Month" from June to September, including energy auditing, subsidy, and rewards.

Integrating society resources to develop networks of energy saving volunteer

- Promote energy saving activities with groups advocating environmental protection, museums and institutes (NGOs).
- Currently there are 4,664 volunteers and 12,056 events organized to promote energy-saving behavior.

The Achievement of Energy Saving in 2019

24 winning corporations, governmental institutions and schools are involved, conserved 29,171 KLOE, saved 555 million NTDs and reduced 129,695 tons emission of carbon dioxide.

Energy Saving Performance Award Winner —
China Steel Corporation (CSC)

A nearly 50 Years old steel manufacturing company continued to launch the third five-year target "2020 Energy-saving Plan" (2016~2020), saving 100 thousands KLOE.

- CSC has put efforts on:
  - Cooperated with the Industrial Technology Research Institute to develop the first 200kW low-temperature heat recovery ORC power generation system in the domestic steel industry for energy using effectively.
  - Energy-saving measures are diverse and comprehensive including process improvement, production management, equipment replacement, energy management, energy recycling, lighting system replacement, etc.

ITRI
Industrial Technology
Research Institute

Developing Energy Efficiency and Integration Technology for Buildings

- **Building systematic process and criteria through technology integration**
- **Technologies: thermal insulation paste, wireless environment sensor, iBEMS & iPOWER, and VFD Cooling Pump.**
- **Advanced technology integration: Active Magnetic Bearing Chiller, Lighting Ergonomics Control, and Bluetooth Logon/i-Sleep for computers.**
- **Applications**
  - Hua-Nan Bank: Monthly saving 10% electricity for branches
  - Hsinchu Science Park Hub : EEWH-RN Diamond Certification
  - Taipower: Estimating annual saving more than 2,200 MWh for three Taipower buildings

Conclusion

- After promoting the EE Management for 5 years, Chinese Taipei has reached significant achievement in energy-saving. EE benchmark of Class 1 for air conditioners and refrigerators reached higher level of energy conservation. The modified MEPS of LED Lamps is the highest standard in the world.

- **The keys to the successful EE management:**
  - ✓ Regulations of both **mandatory** and **voluntary** programs
  - ✓ Incentive promotion
  - ✓ Public awareness & education

The 54th Meeting of the APEC Expert Group on Energy Efficiency & Conservation (EGEEC 54)
23-25 Sep. 2019, Cebu, Philippines

Thank you for your attention