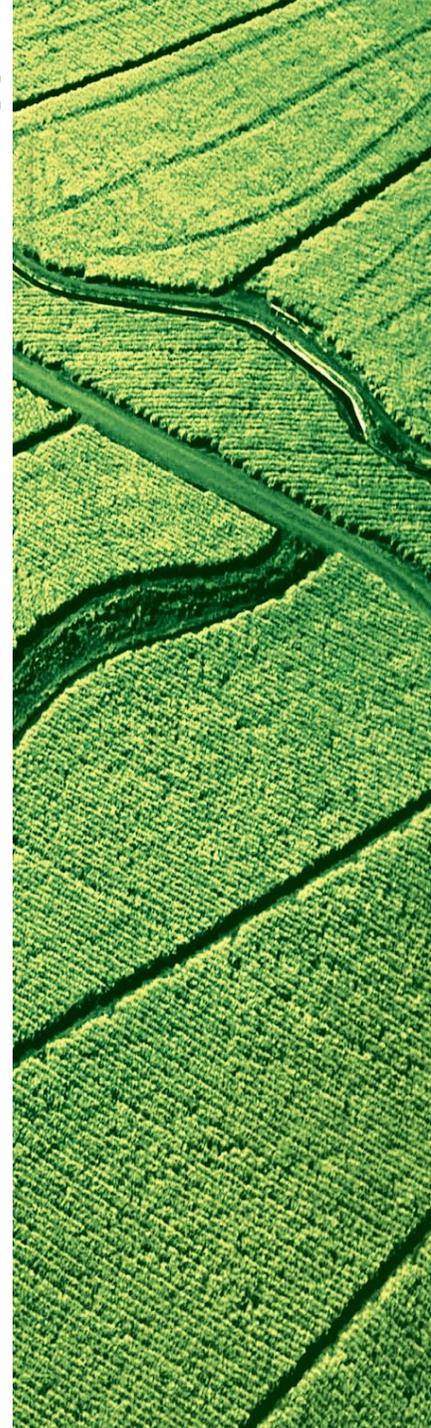




**The 54th Meeting of the APEC Expert
Group on Energy Efficiency &
Conservation (EGEEC 54)
23-25 Sep. 2019, Cebu, Philippines**

Economy Update in Chinese Taipei



Outline

- **Energy Situation**
- **Energy Efficiency Management**
- **Conclusion**

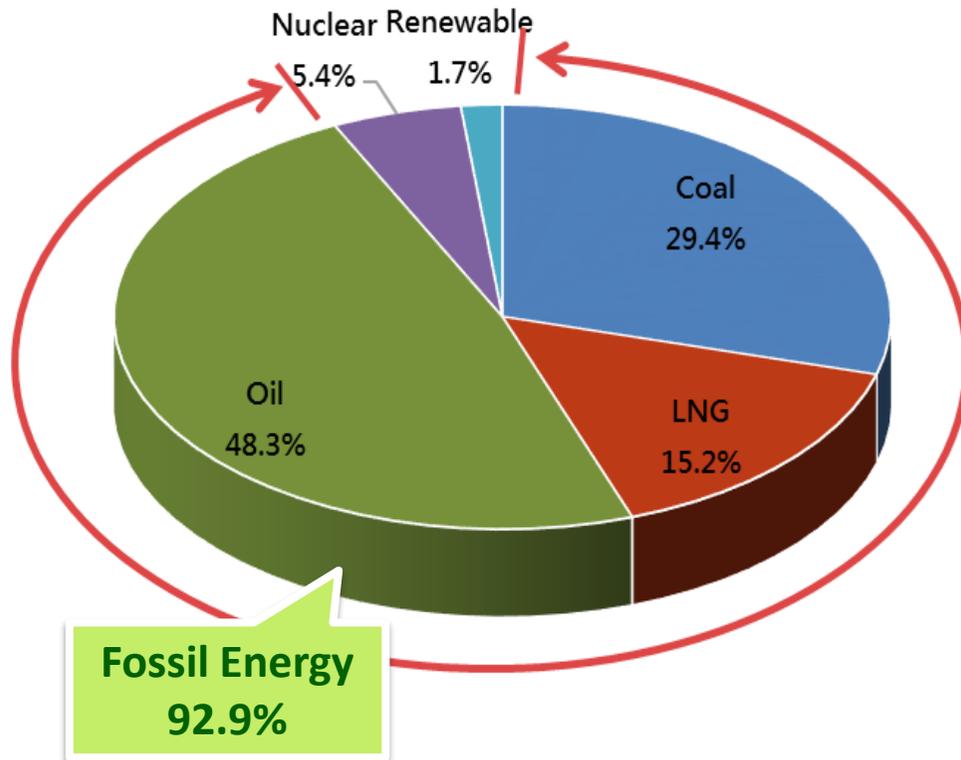
Energy Situation



Structure of Energy Supply and Consumption

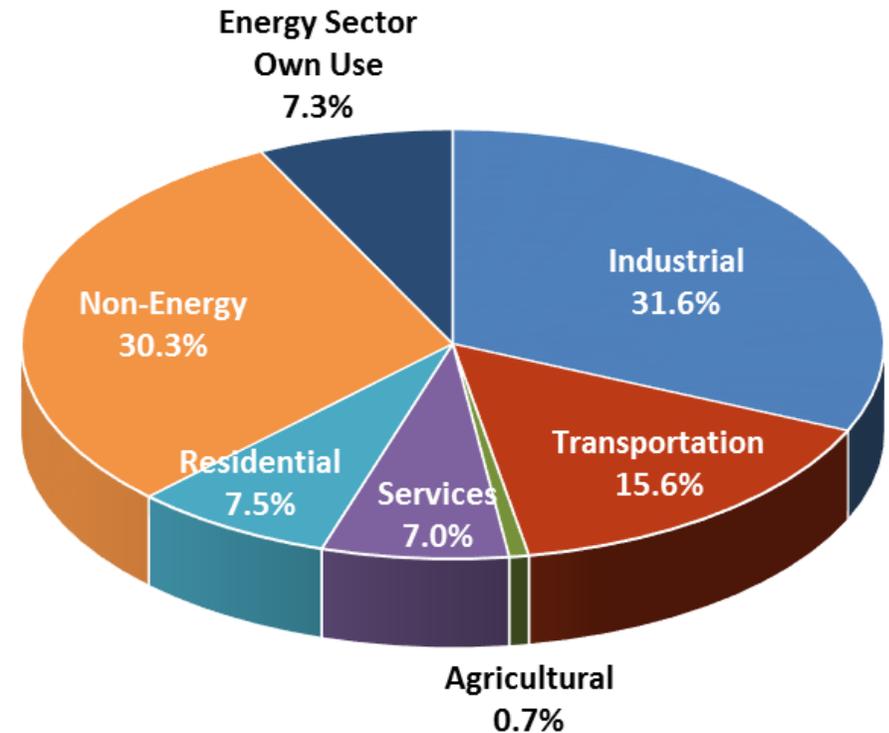
Energy Supply Structure

(148.83 MKLOE* , 2018)



Energy Consumption by Sectors

(86.82 MKLOE* , 2018)



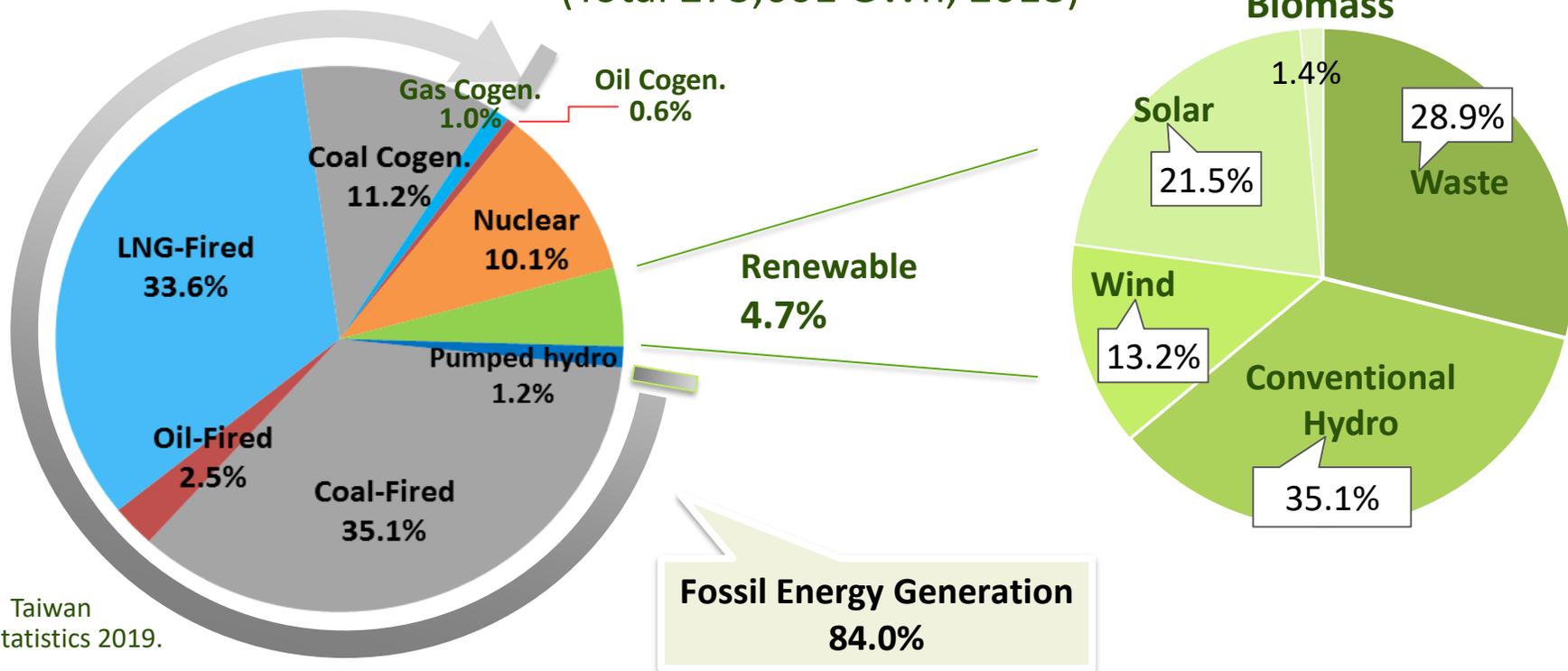
Source : Taiwan Energy Statistics 2019.

*MKLOE: Million Kilo Liter Oil Equivalent

Electricity Generation Structure

Structure of Electricity Generation (by Fuel Category)

(Total 273,601 GWh, 2018)

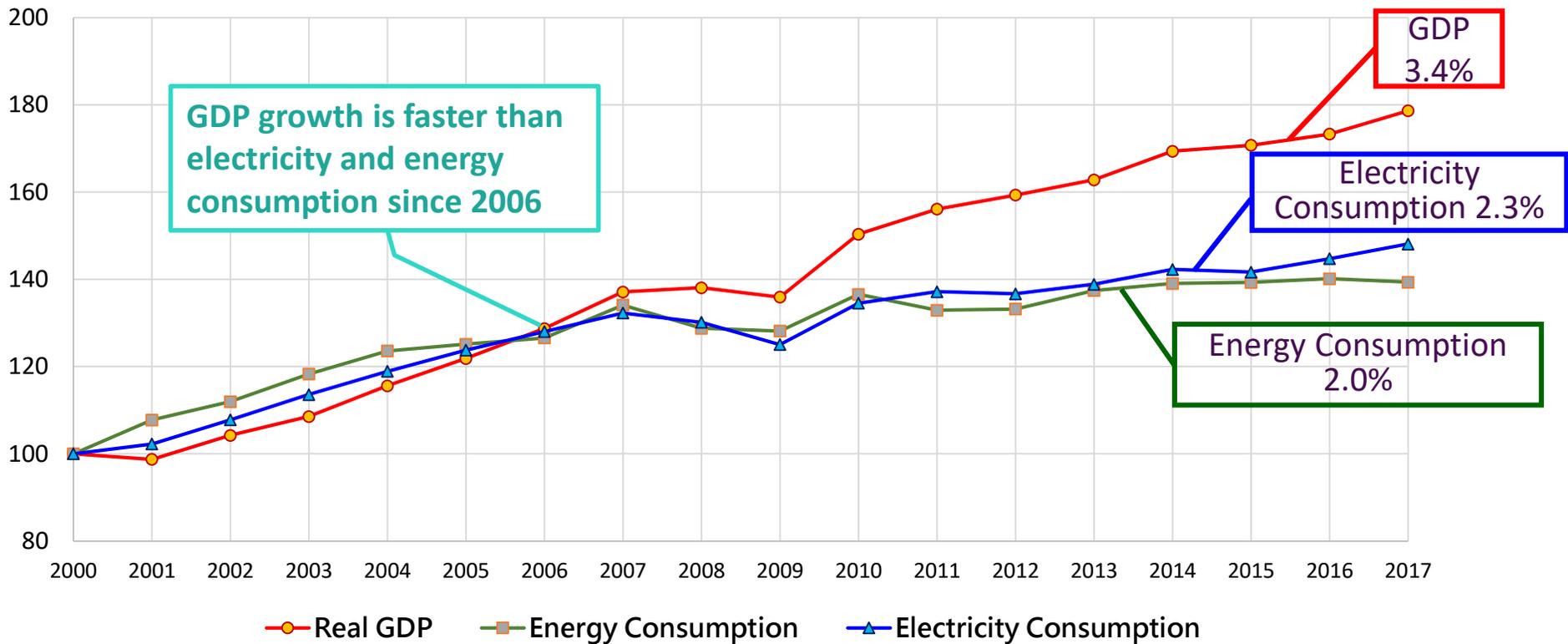


Source : Taiwan Energy Statistics 2019.

The government is driving to a future of nuclear free society.
The 2025 goal of Renewable Electricity Generation: 20%.

Trend of GDP and Energy Consumption

Trend of GDP, Energy and Electricity Consumption Growth



Source : Taiwan Energy Statistics 2019.

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

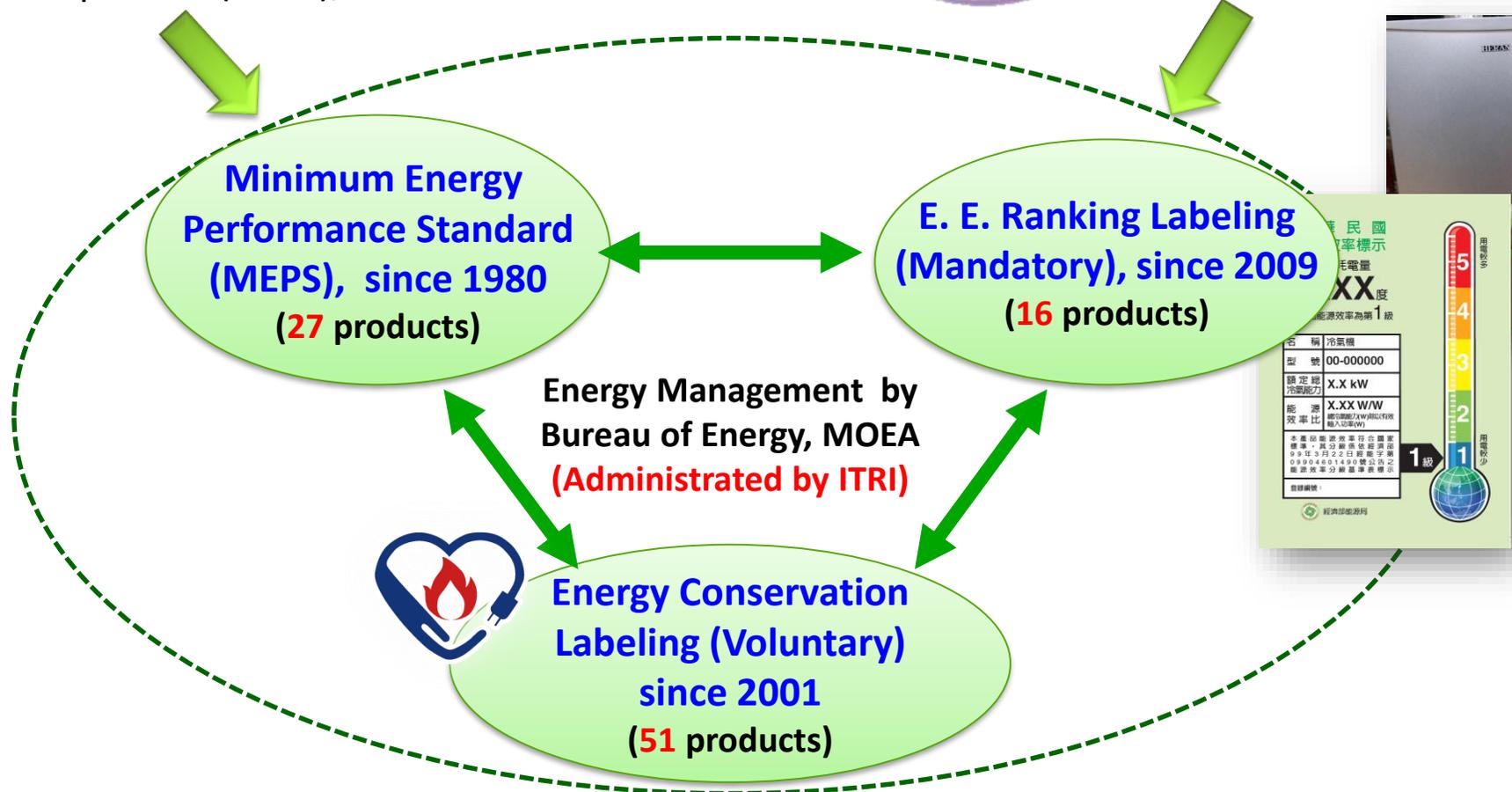


CNS

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



Accreditation Foundation
Testing Lab Accreditation



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 efficient products
Item	27 product categories		16 product categories
Product	<ol style="list-style-type: none"> 1. Air Conditioners (change EER to CSPF in 2016) 2. Refrigerators 3. Dehumidifiers 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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. Air Compressor (2021.01.01)



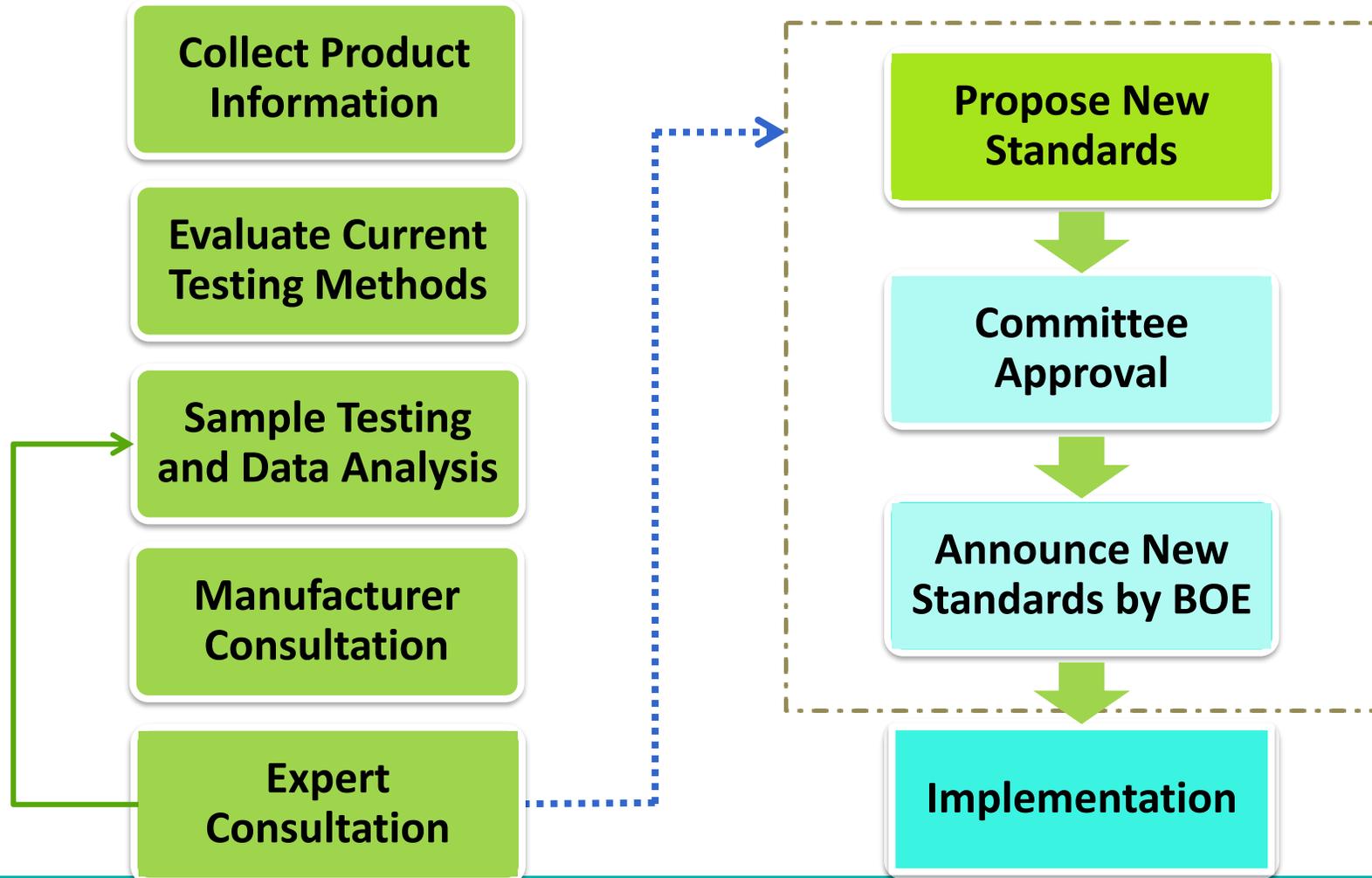
Voluntary EE Management Program



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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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

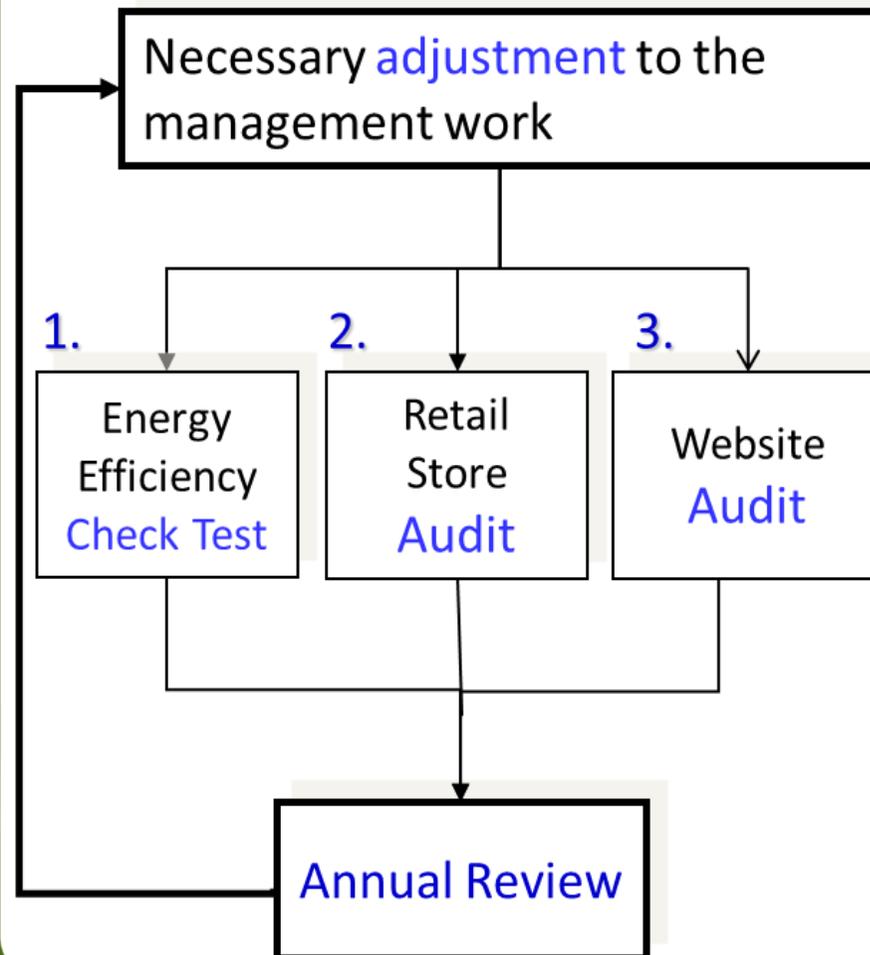


Market Surveillance in ECL program

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

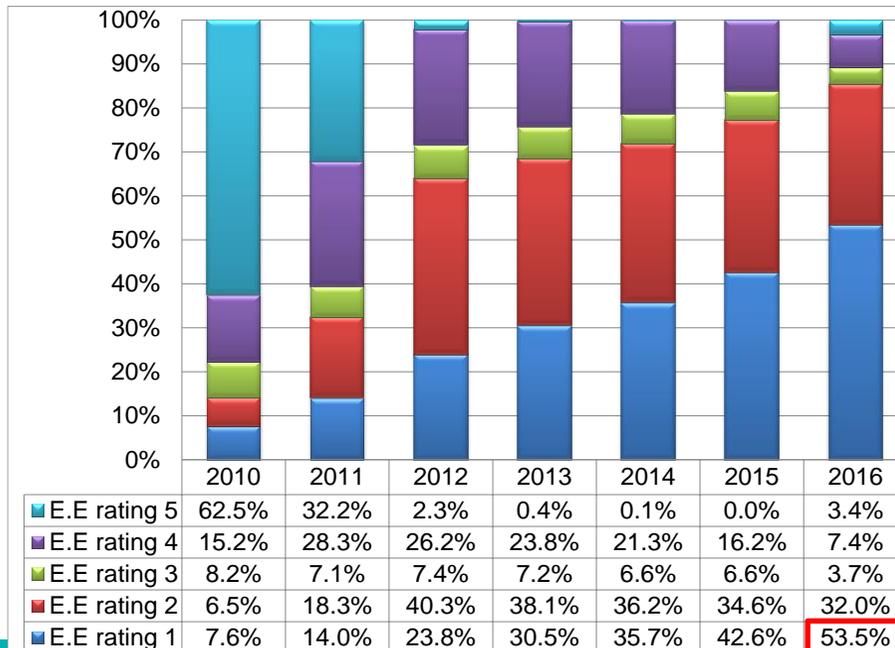
Process Flow



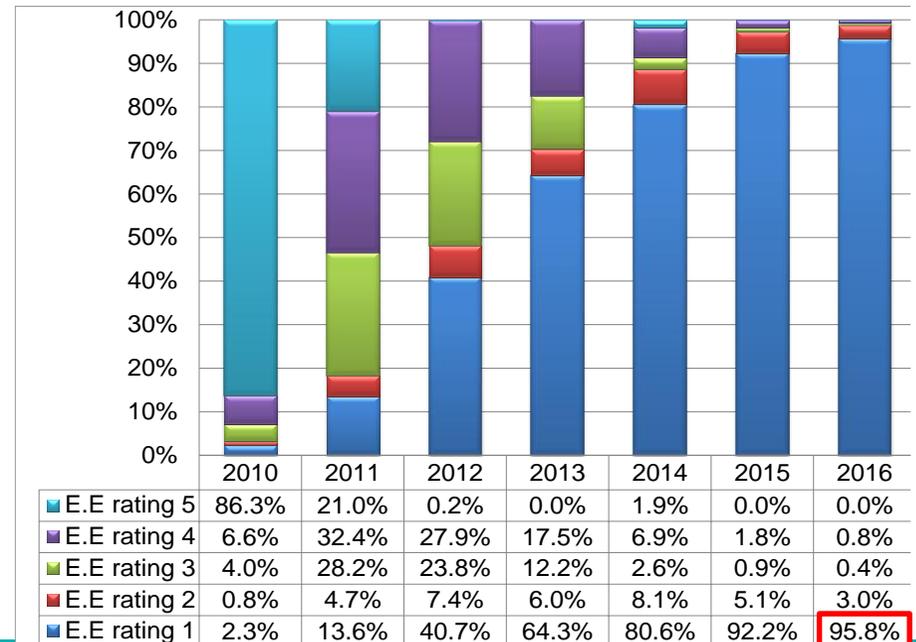
Achievements of EE Ranking Labeling Program (Air Conditioner and Refrigerator as examples)

- 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.
- 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%.

market share of ACs



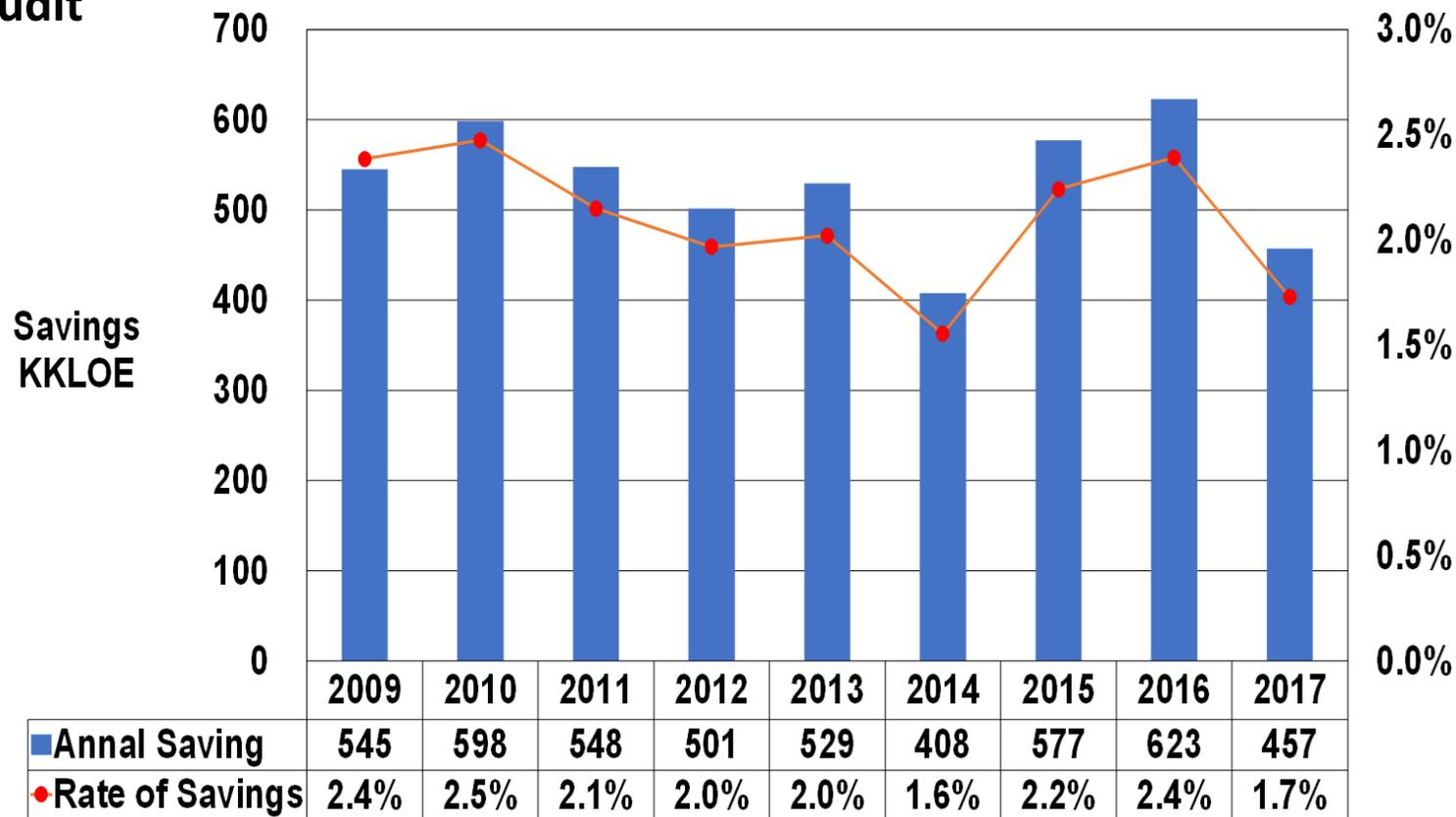
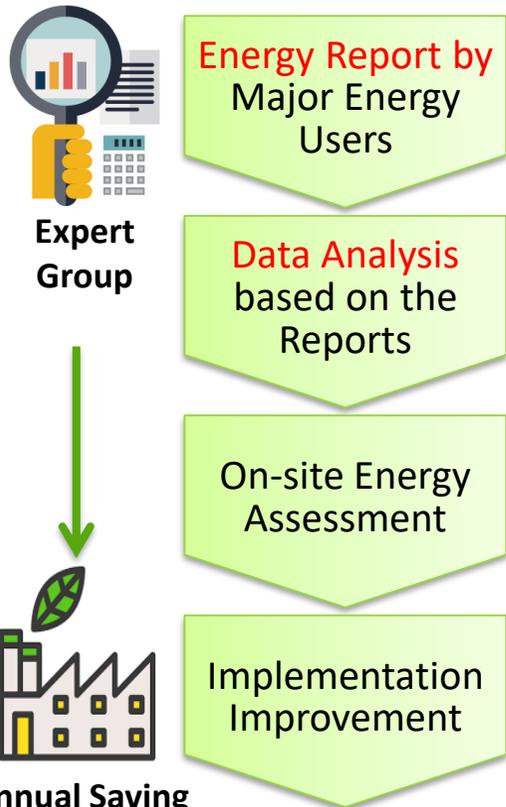
market share of refrigerators



Energy Management and Audit

- Industrial Sector shares 32% of the total energy consumption
- 3,383 companies registered under the Energy Management Act

The process of energy audit



Annual Saving Rate: 2.1%

Public Awareness, Education & Promotion

Holding Energy Saving Campaign during Summertime

- Raise public awareness on energy saving by energy saving online campaign.
- Holding 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

- Promoting energy saving activities with environment protecting groups, museums and institutes (NGOs).
- Gathered 4,133 volunteers, organized 10,040 events so far to promote energy saving behaviour.



The Achievement of Energy Saving in 2018

22 winning corporations, governmental institutions and schools are involved, conserved 16,000 KLOE, saved 240 million NTDs and reduced 61,000 tons emission of carbon dioxide.

Energy Saving Performance Award winner — Spring Pool Glass (SPG)

A 30 Years old Traditional Glass Factory Turned into a Energy Saving star, Reduced 30% of Power Consumption

- SPG has put efforts on:
 - An energy-saving management system to reduce operating costs
 - Reducing heat loss from furnace
 - Highly efficient air compressor
 - Adjusting schedules to effectively avoid power consumption at peak hours



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 : EEWB-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



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Thank you for your attention

