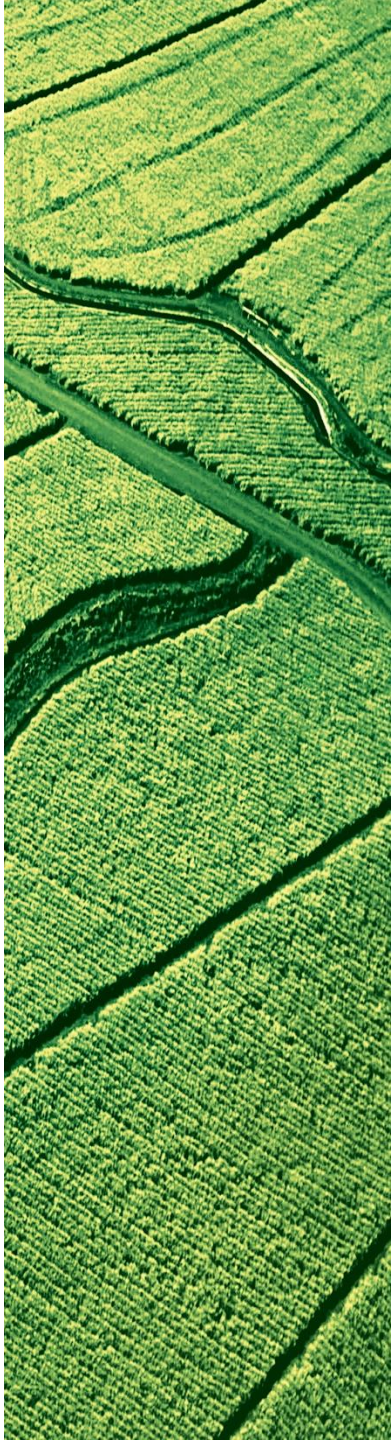
The 58th Meeting of the APEC Expert Group on Energy Efficiency & Conservation (EGEE&C 58)

Economy Update in Chinese Taipei

March. 31 , 2022

Directed: 經濟部能源局 Bureau of Energy , Ministry of Economic Affairs

Administrated: ITRI Industrial Technology Research Institute

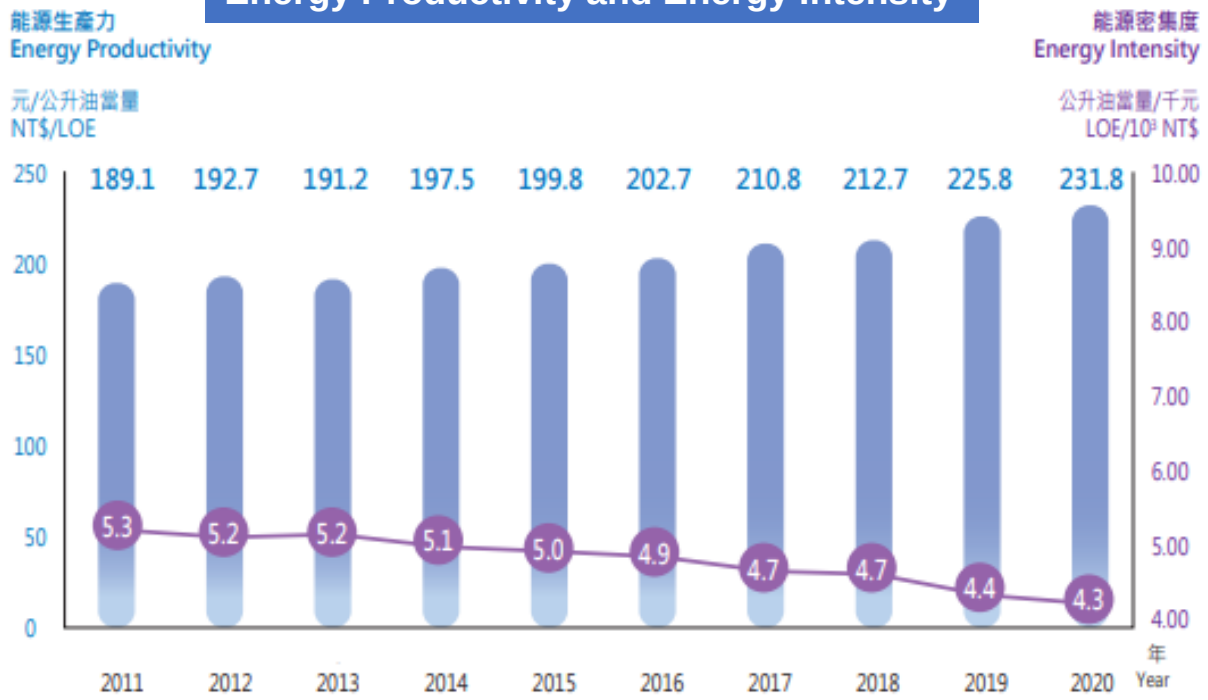


Energy Conservation Goal

Policy goals of Average Energy Intensity and Electricity Intensity improvement from 2017 to 2025:

- **Energy Intensity : -2.4% annually**
- **Electricity Intensity : -2% annually**

Energy Productivity and Energy Intensity



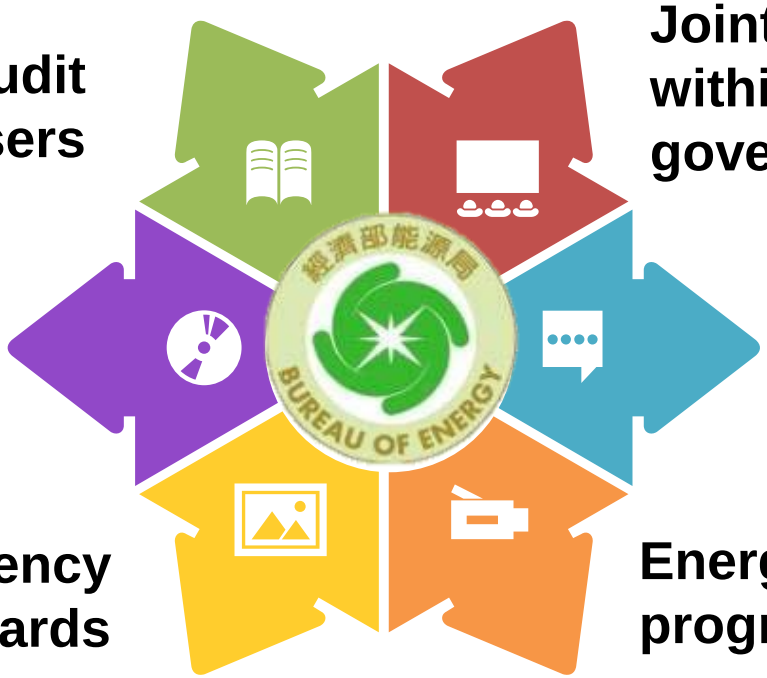
source: Energy Statistic handbook 2020,BOE,MOEA

Enhancing Measures

- Expand the scope of incentives and assistance to energy users.
- Strengthen laws and regulations for continuous improvement.
- Net Zero Emission 2050 Plan is setting by special committee.

Energy audit for large energy users

Joint efforts within local and Central governments



1% energy saving for large energy users

Energy saving auditing

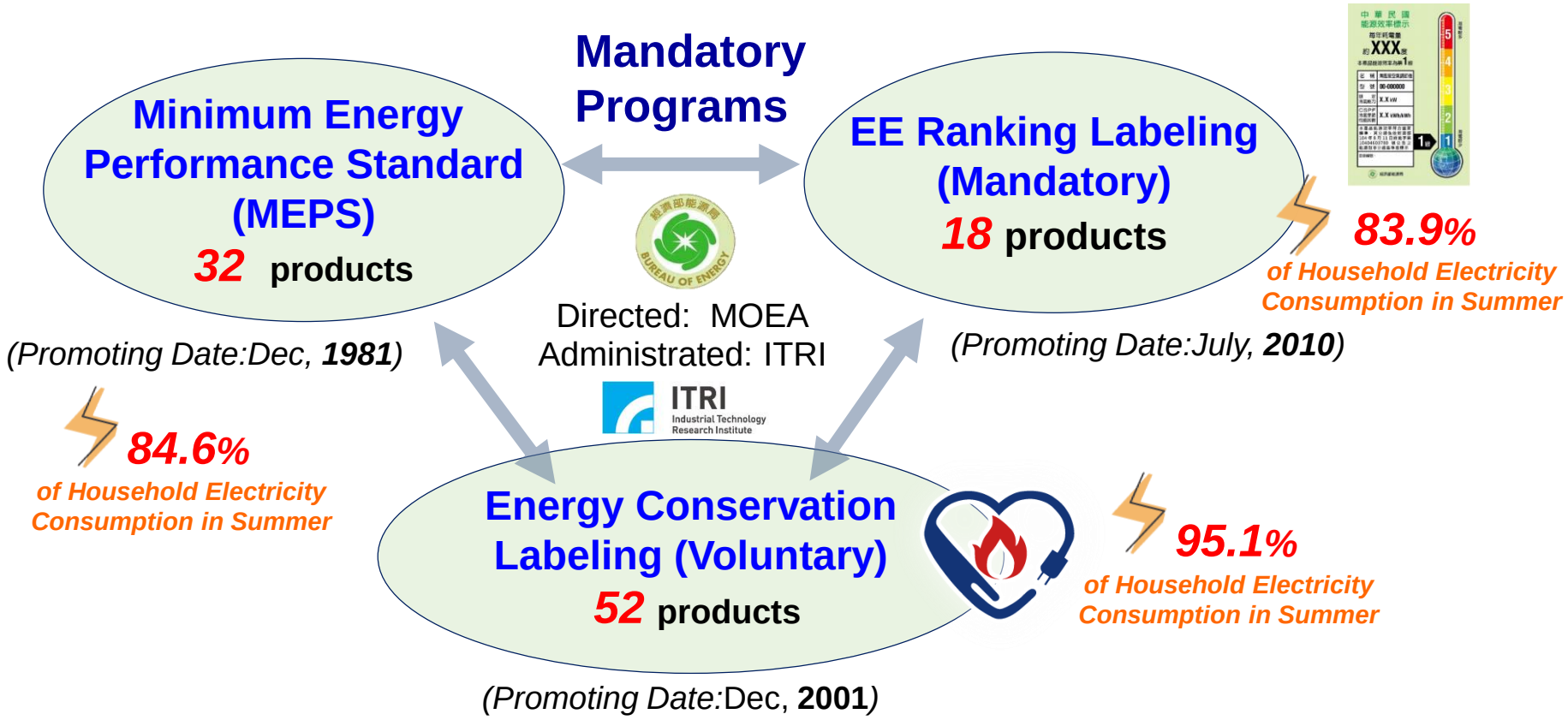
Energy Efficiency standards

Energy saving incentive program

New Carbon Trade Scheme for Industry

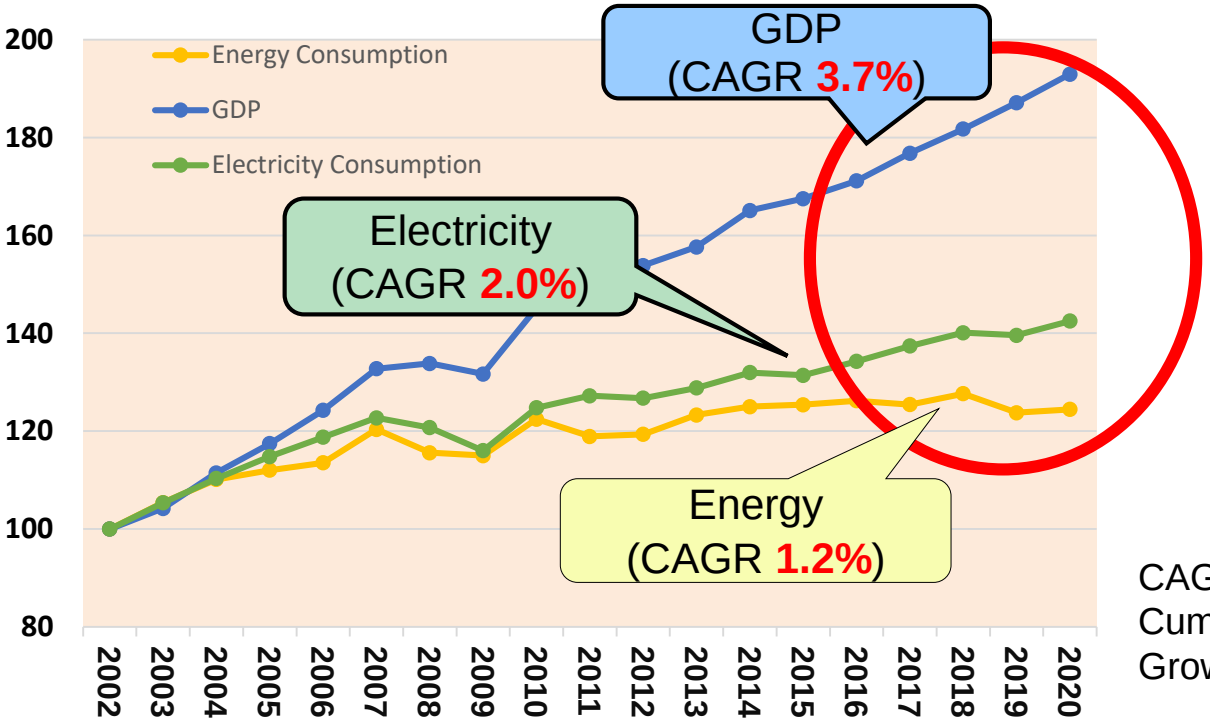
Mandatory & Voluntary Programs

- To provide guidance to consumers for the purchase and to encourage manufacturers to produce high energy efficiency products. Three principal policies have been employed in the promotion of energy efficiency management for equipment and apparatuses.
- Average Energy Intensity improvement from 2017 to 2020 is 3.0% which is better than EC goal 2.4%.



Achievement in Energy Efficiency

- **Improved energy efficiency resulting in contained energy consumption growth**
  - Growth rates of energy and electricity consumption being substantially lower than that of GDP in recent years in Chinese Taipei
  - Data showing energy consumption and GDP moving towards decoupling



CAGR:
Cumulative Annual Growth Rate

Source: BOE (2021), Monthly Energy Statistics.

Energy Transition Indicators

- **We are now in the key era of global energy transition, which is the need to reduce energy related carbon emissions to overcome climate change.**
- **Energy Efficiency improvement is one of the key contributor to the energy transition.**

11 Indicators

01  Reduce energy import rates

02  increasing electricity supply adequacy rate

03  **improving energy efficiency**

04  promoting renewable energy development

05  promoting green economy

06  reducing electricity emission coefficient

07 

reducing air pollution from the power system

08  increasing green vehicles

09  reducing dependence on nuclear energy

10  improving the public's knowledge on energy.

11  Promote the construction of smart meters

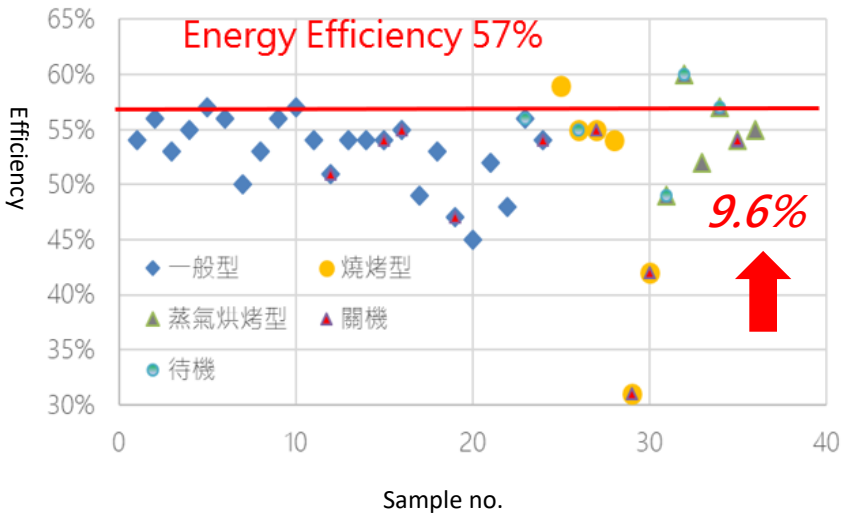
Source: BOE(2021.Jun.) , Energy Transition Whitepaper

Energy Efficiency Standards for Microwave Ovens

- **Voluntary Standard (Energy Conservation Label)**
- **Amendment date: Sep. 24th 2021**
- **Promulgated and in effect**
- **Test standard: CNS 60705**
- **Energy Efficiency: heating efficiency(%)**

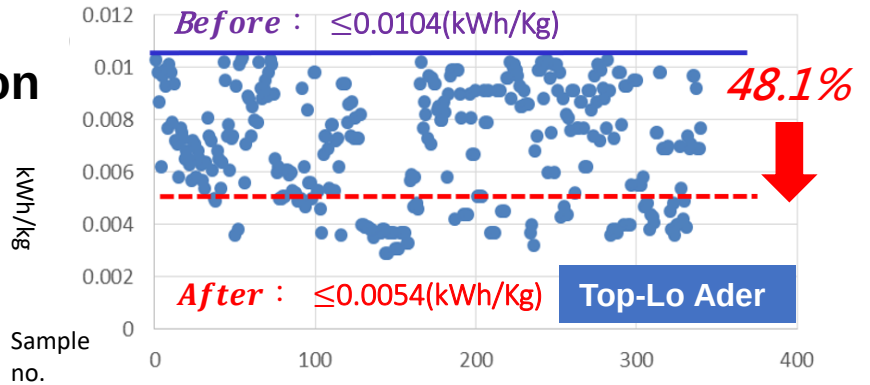
Energy Label for Microwave Ovens

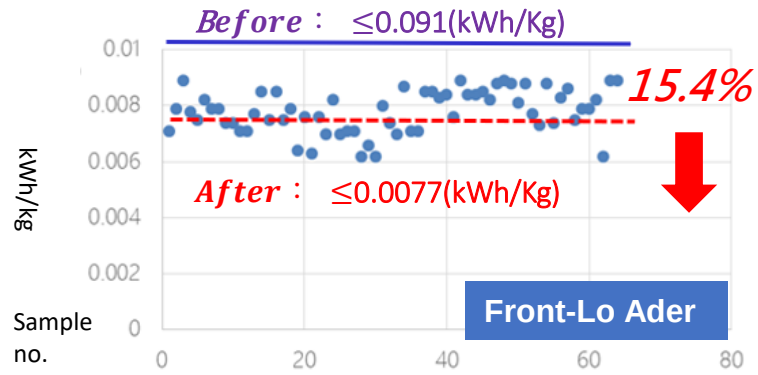
Item		Criteria
Heating Efficiency(%)		≧ 57%
Off-Mode Power Consumption(W)		≦ 0.50
Standby-Mode Power Consumption(W)	Without Message Displayed	≦ 0.50
	With Message Displayed	≦ 1.00
Grill-Mode Power Consumption(W)		< 1.20 (W・hr/℃)



Energy Efficiency Standards for Washing Machines

- **Voluntary Standard (Energy Conservation Label)**
- **Amendment date: Aug. 26th 2021**
- **Effective date: Sep. 1st 2023**
- **Test standard: CNS 60335-2-7**
- **Energy Efficiency: Electricity Consumption**





Energy Label for Washing Machines

Machine Type	Washing Cleaning Ratio	Washing Rinsing Ratio	Water Removal Ratio (%)	Measured Electricity Consumption (kWh/kg-clothes)
Top-Lo Ader (water jet, scroll, stir)	0.8	1.0	45	0.0054
Front-Lo Ader	0.6	1.0	45	0.0077

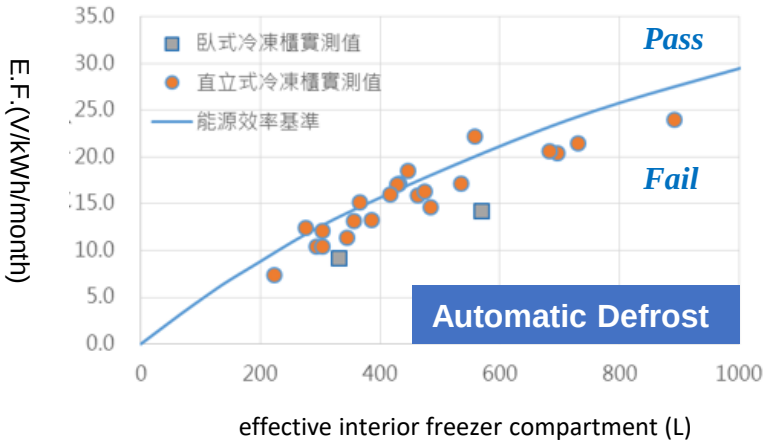
Energy Efficiency Standards for Freezers

- **Voluntary Standard (Energy Conservation Label)**
- **Amendment date: Nov. 29th 2021**
- **Effective date: Dec. 1st 2022**
- **Test standard: CNS 2062**
- **Energy Efficiency: freezing efficiency(%)**

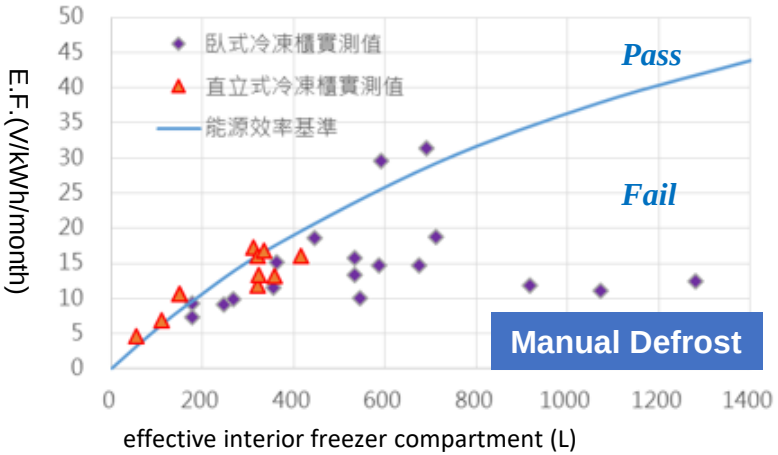
NEW

Energy Label for Freezers

Freezer Type	E.F.(V/kWh/month)
Automatic Defrost	E.F.=(V/(0.014V+19.8))
Manual Defrost	E.F.=(V/(0.011V+16.5))



11.1~45.3%



Energy Efficiency Standards for Schools

- **Air conditioning in every classroom (32.3 B NTD)**
  - Create a safe and comfortable learning environments
  - A total of 3,307 elementary and junior high schools installation
  - AC spec. Energy Efficiency Rating Level 1 (***Mandatory Standard)***
  - School PV program will create electricity which is 1.6 times than that is used in school AC program**.**
  - Energy Management System(EMS) is installed for each school to perform the demand side management.
  - Expected completion date:

before the May 1st, 2022

Energy Efficiency Policy Benefits School Project

The Energy Labeling Customized Automated Auxiliary Online Market Surveillance System

Background

INITIAL SITUATION

- a large number of non-compliance products being sold on online platforms
- resulting in misled consumers
- infringed the rights and interests of consumers and legal manufacturers
- damage the public credibility of energy conservation policies

SOLUTION

- conduct online market surveillance for the Energy Efficiency Labelling compliance on the website.
- Use the AI technology to enlarge the scale of market surveillance

INNOVATION

- Use the web crawler programs and data scraping technics instead of manual page by page reviewing
- Optical Character Recognition technology is used for image and text comparison

About The Project

"The Energy Labeling Customized Automated Auxiliary Online Market Surveillance System"

Web Structure

- Web structure analysis
- writing web crawler programs
- data scraping

Big Data Storage

- auto-extending stacking architecture
- NoSQL data bank
- classified storage

AI Recognition

- utES identification system
- OCR technology
- automatically compares with the "certified database"

Final Verification

- identifies and produces violation reports
- manual final verification
- Execute deadline improvement process

Compared AI method with traditional method

Before

<40,000 inspection the number of pages on the website

website inspection

about 7 people are invested each year through the manual web inspection

few web pages

time-consuming

ineffective、error-prone

After

>1,200,000

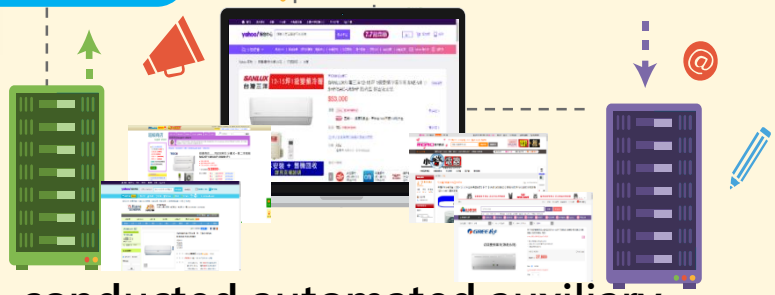
Web analysis

OCR

utES

Web crawler

NoSQL



conducted automated auxiliary online market surveillance system

mass data scraping

AI recognition

High efficiency、low error rate

Main results of The Project

- ✓ **High efficiency**：**Using the automatic auxiliary online market surveillance system, the scope of online inspection web pages increase more than 30 times compared to traditional manual inspection method.**
- ✓ **High labeling accuracy rate**：**Non compliance ratio dropped from 8.55% in 2018 to 0.95% in 2020 .**

Conclusion

- We have implemented a number of energy conservation measures to enhance energy-efficient management.
- Chinese Taipei have proposed 11 indicators of energy transition promotion performance.
- Energy efficiency regulations are key to accelerating the prevalence of high energy-efficient products as well as achieving energy-saving and carbon-reduction goals.
- We expect further collaborations with the experts and economies in the APEC region to address the APEC Energy Intensity Reduction Goal.

Thank You